Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Office of the Secretary Of Defense	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*

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	2,370.567	624.272	810.839	593.609	-	593.609	529.369	455.444	439.511	449.770	Continuing	Continuing
907: *Access to State-of-the-Art (SOTA) Microelectronics - Development*	1,884.670	262.818	311.120	160.435	-	160.435	157.533	156.926	161.416	165.563	Continuing	Continuing
908: *Access to Advanced Packaging and Testing - Development*	153.781	68.221	90.199	92.404	-	92.404	91.055	63.751	65.278	66.700	Continuing	Continuing
911: *Access to Radiation Hardened RF and Opto-Electronic Development*	219.572	196.908	279.416	210.076	-	210.076	151.674	124.347	124.058	126.762	Continuing	Continuing
912: *Create an Evidence-Based Assured Microelectronics Pipeline*	112.544	92.401	126.081	130.694	-	130.694	129.107	110.420	88.759	90.745	Continuing	Continuing
913: *Defense Microelectronics Cross-Functional Team Funding*	0.000	3.924	4.023	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing

Note

New Start (Y/N): No

FY 2024: An Errata was approved to realign $50.000 million to Procurement, DW, Major Equipment, OSD to support the Accelerate Procurement and Fielding of Innovative Technologies (APFIT) program. These funds are realigned from Project 907, Access to State-of-the-Art (SOTA) Microelectronics - Development. The current plan of $311.120 will decrease to $261.120 million.

A. Mission Description and Budget Item Justification

This program supports microelectronics modernization activities that enable defense systems to keep pace with commercial microelectronics technological advances, reduce reliance on obsolete microelectronics, and mitigate the Department's reliance on sole source foundries for assured state-of-the-art (SOTA) microelectronics. It addresses the challenges of 1) having enduring access to a multiplicity of modern manufacturing processes that require commercial volumes to maintain long term viability and 2) protecting the intellectual property (IP) of the microelectronic parts that are manufactured.

Microelectronics technology is a critical enabler for the development of new systems and sustainment of fielded systems required for all four 2022 National Defense Strategy (NDS) priorities. In addition, this program directly supports the NDS priority of building a resilient Joint Force and defense ecosystem through modernization of key capabilities and fostering pathways to adapt SOTA commercial and dual-use technologies to Defense needs. This program also supports the NDS objective of

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Office of the Secretary Of Defense	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide I* BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604294D8Z *I Trusted and Assured Microelectronics*

Making the Right Technology Investments by supporting the domestic microelectronics innovation ecosystem and partnering with industry to quickly incorporate market-driven commercial advances with military-relevant capabilities.
This program supports the OUSD(R&E) Microelectronics Modernization Roadmap. The primary areas of focus of this roadmap include the following: access to state-of-the-art microelectronics technology, access to advanced packaging and test; access to the best commercial design technology; evidence-based assurance and secure design; foundry access; policies, standards, and Joint Federated Assurance Center (JFAC) governing body; access to radiation hardened microelectronics; access to non-complementary metal oxide semiconductor state-of-the-art (SOTA) microelectronics for radio frequency and optoelectronic applications; education and workforce development; and supply chain awareness and security.

Recognizing that an assured supply of microelectronics is a U.S. Government (USG)-wide concern, this activity will interface with interagency partners to account for interagency requirements, opportunities for collaboration, and strategic decisions that can be made to limit the overall cost of these requirements to the USG.

This activity is being led by the Under Secretary of Defense for Research and Engineering.

B. Program Change Summary ($ in Millions)	FY 2023	FY 2024	FY 2025 Base	FY 2025 OCO	FY 2025 Total
Previous President's Budget	644.326	810.839	749.010	-	749.010
Current President's Budget	624.272	810.839	593.609	-	593.609
Total Adjustments	-20.054	0.000	-155.401	-	-155.401
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	-			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-19.990	-			
• Program Adjustments	-	-	-155.401	-	-155.401
• Cancelled Account	-0.064	-	-	-	-

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Project: 911: *Access to Radiation Hardened RF and Opto-Electronic Development*		
Congressional Add: *GaN and GaAs RFIC technology*	25.000	-
Congressional Add: *Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics*	38.000	-
Congressional Add: *Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology*	10.000	-
Congressional Add: *Magnetoresistive Random Access Memory (MRAM)*	3.500	-

Exhibit R-2, RDT&E Budget Item Justification: PB 2025 Office of the Secretary Of Defense	Date: March 2024
Appropriation/Budget Activity 0400: *Research, Development, Test & Evaluation, Defense-Wide* / BA 4: *Advanced Component Development & Prototypes (ACD&P)*	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2023	FY 2024
Congressional Add Subtotals for Project: 911	76.500	-
Congressional Add Totals for all Projects	76.500	-

Change Summary Explanation

FY 2024: An errata was submitted and approved to realign $50.000 million to Procurement, DW, Major Equipment, OSD to support the Accelerate Procurement and Fielding of Innovative Technologies (APFIT) program.

The FY 2025 decrease of -$155.401 million is due to the following:
1) A realignment of -$50.000M to Procurement, Defense-Wide, Major Equipment, OSD in Program Element 0901388D8Z to support the Accelerate Procurement and Fielding of Innovative Technologies (APFIT) program.
2) A realignment of -$94.900M to Mission Engineering and Integration (ME&I) Program Element 0603142D8Z, Advanced Analytics and Capability Development (A2CD) to support efforts to integrate data, tools and techniques to speed delivery of capabilities to the warfighter. This supports the National Defense Strategy goal to build on our Enduring Advantages.
3) A realignment of -$1.122M to the Defense Innovation Acceleration (DIA) Program Element 0603838D8Z.
4) A reduction of -$6.027M in FY 2025 was applied to meet DoD overall funding reductions, which were spread to mitigate impact.
5) An internal realignment of -$4.550 to move funds to support Program Element 0603379D8Z, Advanced Technical Integration.
6) Funding increase of $1.198 million for Economic Assumptions.

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense			Date: March 2024
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*	

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
907: *Access to State-of-the-Art (SOTA) Microelectronics - Development*	1,884.670	262.818	311.120	160.435	-	160.435	157.533	156.926	161.416	165.563	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

Microelectronics are critical technologies that drive the modern economy and enable the defense systems that allow warfighters to accomplish their missions. Other nations recognize the need to control the microelectronics supply chain and indigenous state-of-the-art (SOTA) manufacturing. Aggressive investments and licit and illicit actions by peer nations threaten U.S. leadership. China alone purports investment of $150 billion and a national strategy to achieve dominance in all major areas of microelectronics by 2030. Russia and China have publicly stated that advanced microelectronics, AI, and machine learning (ML) are the keys to economic and military dominance.

This project funds the operation software assurance (SwA) support to DoD programs and organizations of the Joint Federated Assurance Center (JFAC), established in National Defense Authorization Act (NDAA) Sec 937, to increase DoD's SwA by providing engineering tools, technical services, best practices, innovative technologies and other assistance to programs to detect, assess, prioritize, and mitigate vulnerabilities from malicious software and assurance against supply chain exploitation vulnerabilities. The JFAC will provide capabilities for programs to keep assessment findings throughout the life cycle of their systems for data mining (e.g., documentation on rationale for previous mitigation decisions). The collaboration between the JFAC and program offices will help mitigate existing and emerging critical threats and vulnerabilities in software to all DoD programs.

The project supports the implementation of Executive Order 14028 Improving the Nation's Cybersecurity for software assurance for critical software such as software bill of materials, and information communications technology supply chain risk management, and the PD, Cyber Roadmap for mitigation of software vulnerabilities that are cyber related.

This project includes establishment of new strategic partnerships with existing commercial SOTA domestic foundries to develop a data-driven, risk- based approach to supply chain protection and develop the assured access, secure design, and manufacture of advanced microelectronics technology and electronic components.

Successful implementation will transition these technologies to use in DoD programs, obtain access to multiple commercial microelectronics facilities, establish secure design capabilities, and solidify a data-driven approach to supply chain protection. It also includes keeping pace with the rapid advancements in microelectronics technology and the globalization of this industry sector. It will provide the basics for updating and strengthening DoD assurance policy and includes collaborating with industry to develop data driven evidence-based practices.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Joint Federated Assurance Center (JFAC)	10.820	6.956	-

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Description: This project's activities will advance the state of the art for trust and assurance by the federated assurance labs for both hardware and software assurance for the DoD enterprise to both accelerate the development of assurance technologies and to ensure the integrity of DoD weapon systems, information systems, and national security systems in direct support of program offices across the life cycle. JFAC is the center that bridges the various federated DoD organizations together across the Joint Services and the National Security Agency (NSA). JFAC advances the development of assurance technologies, offers scalable enterprise assurance capabilities, fosters a thriving assurance ecosystem, and provides access to leading assurance solutions to include policies, guidance, best practices, training, resources, tools, assessments, personnel, source code, and data. ***FY 2024 Plans:*** • Continue to Select and procure quantities of state-of-the-art software assurance (SwA) tools; innovate and advance technology for vulnerability and subverted code detection of binary code in DoD embedded systems; evaluate high payoff open source components required to move DoD systems to the cloud using containers; technology and infrastructure support to programs to determine and mitigate exploitable vulnerabilities; map vulnerabilities and threats to SwA tool capabilities and provide assessments of how well SwA tools and techniques function directly to programs. • Execute enterprise license program procurement of SwA tools. • Continue to align expanding JFAC infrastructure to cloud native environments to support hardware assurance, deploy SwA tools, training, shared experiences, and best tool-use practice directly to programs and organizations. • Develop and make directly available to programs and organizations beyond leading edge acquisition software vulnerability mitigations, standards and technical implementation guidance, workforce training packages, and subject matter expertise. • Continue efforts to support implementation of Executive Order 14028 Improving the Nation's Cybersecurity for software assurance for critical software, and the software bill of materials. • Continue to implement FY 2019 NDAA Section 1655 - Mitigation of risks to national security posed by providers of information technology products and services who have obligations to foreign governments ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease of $6.956 million between FY 2024 and FY 2025 is due a change in priorities and the funding being realigned to the Mission Engineering and Integration (ME&I) Program Element 0603142D8Z to support efforts to integrate data, tools and techniques to speed delivery of capabilities to the warfighter.			
Title: Access to State-of-the-Art (SOTA) Microelectronics - Development	251.998	304.164	160.435
Description: Foundry Access: This activity implements multiple foundries process design kit (PDK) environments ensuring the government is not dependent			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
on one single source for critical components. Demonstrate hardware through dedicated and multi-project wafer runs at multiple foundries. Commercial foundries generate enormous amounts of data on their processes as a best practice for quality assurance to improve reliability and increase yield. The Foundry program collects and utilizes this data to generate and allow quantitative comparison of performance and security metrics in the design and test stage of the microelectronics lifecycle, thereby mitigating risk. Rapid Access to Microelectronic Prototypes (RAMP): This activity includes developing the ability to fabricate classified and/or export-controlled designs in on-shore commercial foundries. Funding will establish multiple strategic partnerships with existing commercial domestic microelectronics design vendors and foundries to develop a data-driven, risk-based approach to supply chain protection and demonstrate the assured manufacture of advanced electronic components. This project demonstrates the technical means for protecting intellectual property (IP) and obfuscating the final user function from the supply chain will be realized using personalization, programmability and software, following application specific integrated circuit (ASIC) manufacturing. Efforts are on-going to update International Traffic in Arms Regulations (ITAR) and Export Administration Regulations (EAR) policy in this area. Funding supports activities to enhance the export control regime so that it maintains or strengthens current protections while enabling access to commercial capabilities, products, and IP. Rapid Access to Microelectronic Prototypes – Commercial (RAMP-C): This project enables the DoD and the defense industrial base to collaborate with the commercial microelectronics industry to increase prototype development, demonstration, and address the war fighter's need to maintain and modernize weapon systems as the threat landscape shifts. This project enables the Trusted and Assured Microelectronics (T&AM) program to demonstrate, by FY 2025, full access to U.S. commercial state-of-the-art (SOTA) design, foundry, and advanced packaging capability and meet DoD's unique needs within two to three years for modernization, including for radiation hardened (RH) and photonics applications. The capability will reduce the time needed to replace microelectronics components that are generations behind the commercial sector, move away from off-shore sources for SOTA commercial integrated circuits, and accelerate the demonstration and adoption of evidence-based assurance methods throughout the microelectronics lifecycle and supply chain. Reducing the timeline by up to two years not only benefits export control and classified system protection, but also the requirements of Section 224 in FY 2020 National Defense Authorization Act for the DoD to implement commercial standards for			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
the acquisition of assured microelectronics products. ***FY 2024 Plans:*** Foundry Access: • Continue to enhance access to SOTA fabrication ecosystem. • Maintain access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. RAMP: Continue to mature the RAMP operational capability that will: • Continue to enhance secure design and cloud capability with new tools/techniques. • Continue to utilize traceability and provenance mechanisms to verify and vet data sources in a zero-trust architecture and enhance ability of DoD/Defense Industrial Base to design SOTA microelectronics. • Continue to quantify transition of designs to prototypes and programs of record and maintain persistence in lifecycle assurance data and intellectual property. • Continue to demonstrate rapid transition of DoD-relevant field programmable gate array-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture. RAMP-C: A leading edge (<7 nanometer), commercially-viable, U.S.-located domestic wafer foundry ecosystem access is established. The ecosystem will have capability on the order of > 26,000 wafer starts per month for design and manufacturing of evidence-based assured, dual-use commercial and DoD custom integrated circuits. This project will enable the following: • Access to a SOTA U.S. wafer foundry. • Access to commercial and critical evidence-based assured dual-use commercial off-the-shelf (COTS) integrated circuits. • Access to capabilities necessary to develop evidence-based assured custom DoD integrated circuits. • The jump-start in commercial use of the domestic foundry by key U.S. fabless companies. • Establishment of a viable design ecosystem including access to 3rd party design modules. • The reduction in the cost differential of building a U.S.-located wafer foundry verses off-shore. • The enablement of commercially-supported and enduring U.S. logic foundry capability. • Leverage the expertise of commercial industry to develop and demonstrate novel capabilities for design of State-of-the Art (SOTA) with assurance.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Cloud/Electronic Design Automation (EDA): • Continue activities for prototype demonstration of an emulation based evidence-based assurance design flows • Continue efforts to raise the technology readiness level (TRL) of pilot emulation efforts to production readiness by standardizing the cloud-based emulation workflows, enhancing the robustness of the flows, and bringing them up to IL-4 Design Acceleration and Transition: Continue to accelerate DoD access to a microelectronics evidence-based assurance design and manufacturing ecosystem leveraging commercial capabilities for long-term sustainability. The following activities could be included: • Establish activities with Design Acceleration Centers to leverage commercial intellectual property (IP), electronic design automation (EDA), and processes enabling prototype transition acceleration • Continue to develop and evaluate IP for application-specific integrated circuit (ASIC) and Chiplet security including authentication, Firmware Attestation and Decryption and system-on-chip (SOC) Interface encryption. • Continue to develop, evaluate, and insert tools and techniques to protect silicon IP during manufacturing and test phase, including multi- chip package (MCP) with full lifecycle evidence-based assurance demonstration and maturation. • Continue demonstration of using commercial off-the-shelf (COTS) parts in more critical DoD applications utilizing evidence-based the inherent personalization features of the COTS device. • Continue to accelerate the development and evaluation of secure ASIC design for DoD unique applications. • Transition the Rapid Assured Microelectronics Prototypes (RAMP) prototype capability to enhance secure design and cloud capability with new tools/techniques to the joint Office of Under Secretary of Defense for Research and Engineering and Office of Under Secretary of Defense for Acquisition and Sustainment's Design to Transition Accelerator (D2TA) operational capability. ***FY 2025 Plans:*** Foundry Access: • Continue to enhance access to state-of-the-art (SOTA) fabrication ecosystem. • Maintain program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. RAMP-C:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
A leading edge (<7 nanometer), commercially-viable, U.S.-located domestic wafer foundry ecosystem access is established. The ecosystem will have capability on the order of > 26,000 wafer starts per month for design and manufacturing of evidence-based assured, dual-use commercial and DoD custom integrated circuits. This project will enable the following: • Access, meaning the ability for DoD programs and the defense industrial base to purchase parts and devices with the necessary assurance, to a SOTA U.S. wafer foundry, to commercial and critical evidence-based assured dual-use COTS integrated circuits, and to capabilities necessary to develop evidence-based assured custom DoD integrated circuits. • The jump-start in commercial use of the domestic foundry by key U.S. fabless companies. • Establishment of a viable design ecosystem including access to 3rd party design modules. • The reduction in the cost differential of building a U.S.-located wafer foundry verses off-shore. • The enablement of commercially-supported and enduring U.S. logic foundry capability. • Leverage the expertise of commercial industry to develop and demonstrate novel capabilities for design of State-of-the Art (SOTA) with assurance. Cloud/Electronic Design Automation (EDA): • Continue activities for prototype demonstration of an emulation based evidence-based assurance design flows • Continue efforts to raise the technology readiness level (TRL) of pilot emulation efforts to production readiness by standardizing the cloud-based emulation workflows, enhancing the robustness of the flows, and bringing them up to IL-4 Design Acceleration and Transition: • Continue activities with Design Acceleration Centers to leverage commercial intellectual property (IP), EDA, and processes enabling prototype transition acceleration • Continue to expand and accelerate development and evaluation and initiate insertion of IP for application-specific integrated circuit (ASIC) and Chiplet security including authentication, Firmware Attestation and Decryption and system-on-chip (SOC) Interface encryption. • Continue to develop and evaluate, and initiate insertion of, tools and techniques for Protect of silicon IP during manufacturing and test phase, including multi-chip package (MCP). • Continue development of using commercial off-the-shelf (COTS) parts in more critical DoD applications utilizing the inherent personalization features ***FY 2024 to FY 2025 Increase/Decrease Statement:*** A decrease of $50M in FY 2024 due to approved Errata. Revised Plan is for FY 2024 $261.120M but $311.120.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
The decrease of -$94.053 million is due to a realignment of -$4.306 million to the Mission Engineering and Integration (ME&I) Program Element 0603142D8Z, a realignment of -$1.122 million to the Defense Innovation Acceleration (DIA) Program Element 0603838D8Z. The remaining reduction of -$88.625 million is due to a planned reduction due to the maturation of activities on the RAMP and RAMP-C projects.			
Accomplishments/Planned Programs Subtotals	262.818	311.120	160.435

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Funding increase of $.324 million in FY 2025

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to SOTA Microelectronics - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	1,884.670	262.818	Mar 2023	311.120	Mar 2024	160.435	Mar 2025	-		160.435	Continuing	Continuing	-
		Subtotal	1,884.670	262.818		311.120		160.435		-		160.435	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.324 million FY 2025, ($1.557 million FY 2025-2029) for Economic Assumptions

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,884.670	262.818		311.120		160.435		-		160.435	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.324 million FY 2025, ($1.557 million FY 2025-2029) for Economic Assumptions

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

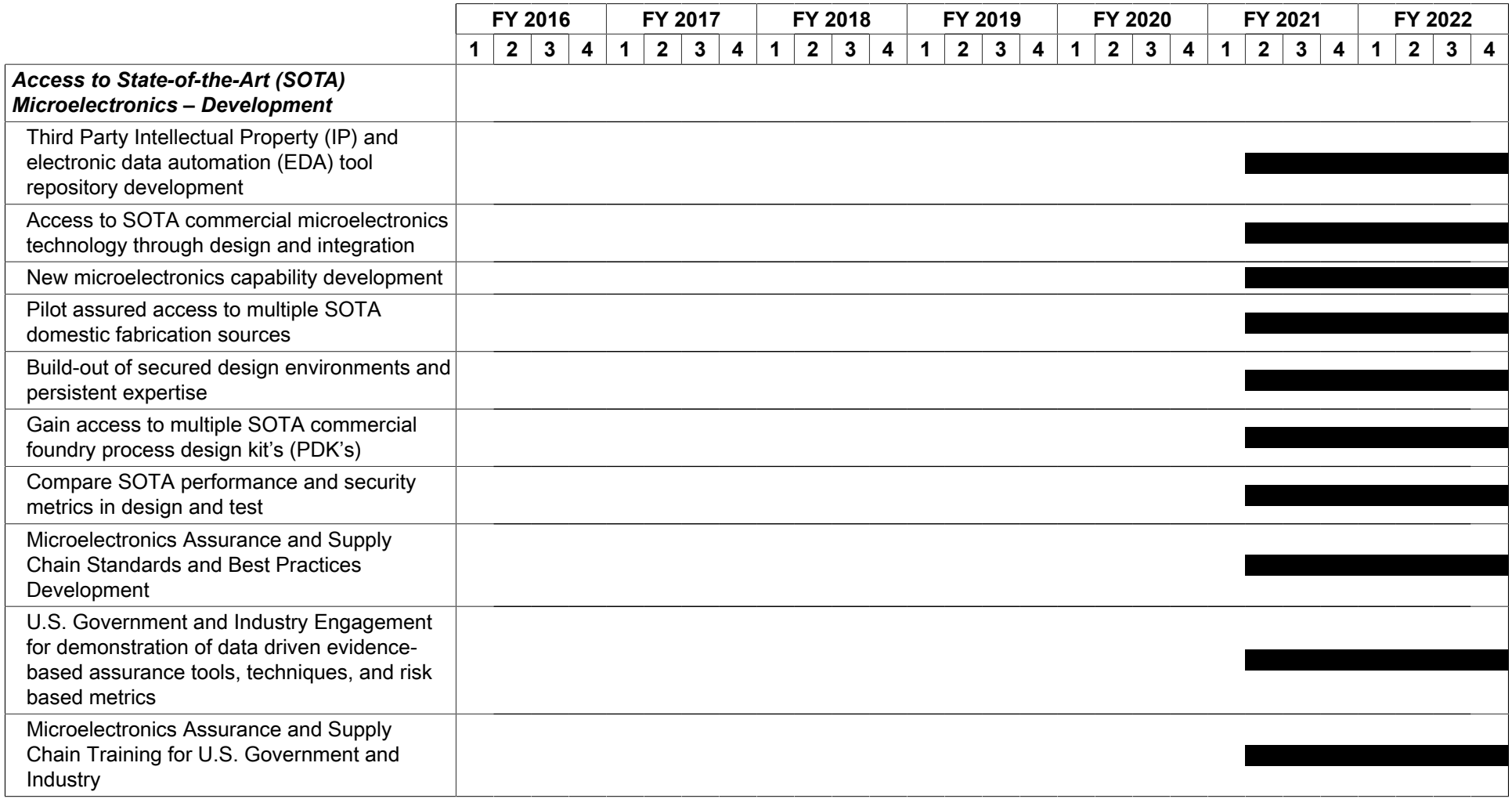
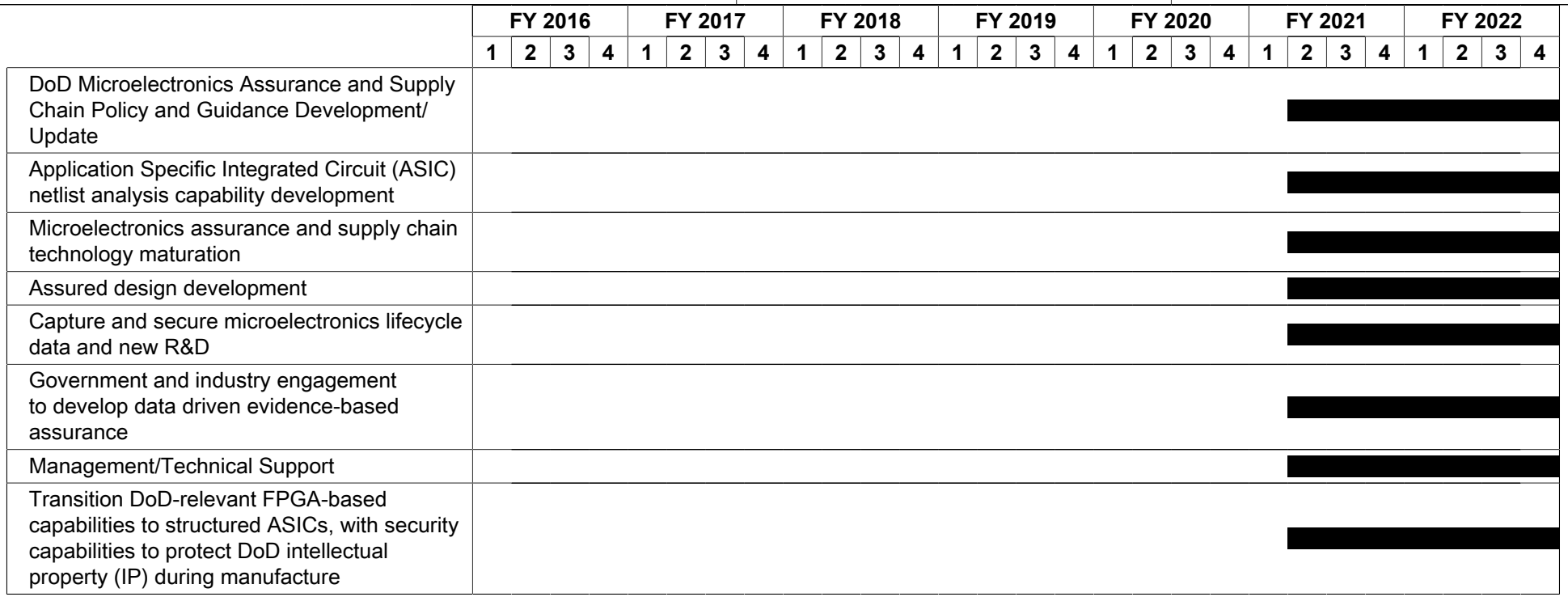


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*



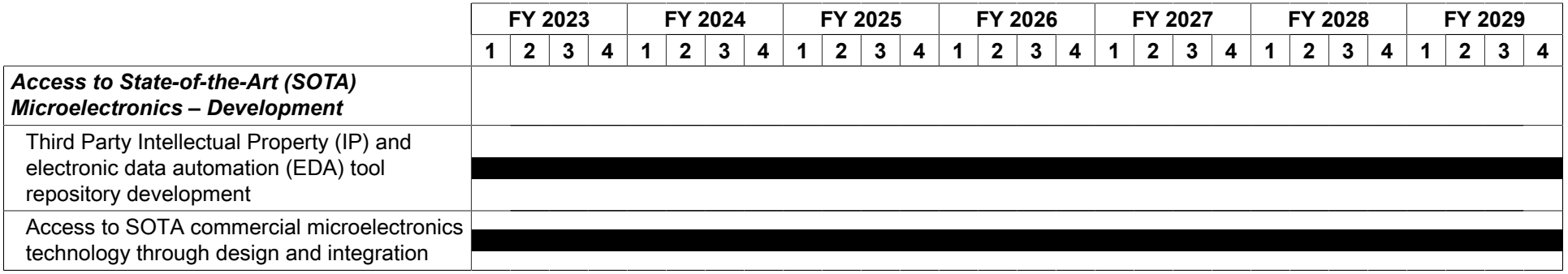


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

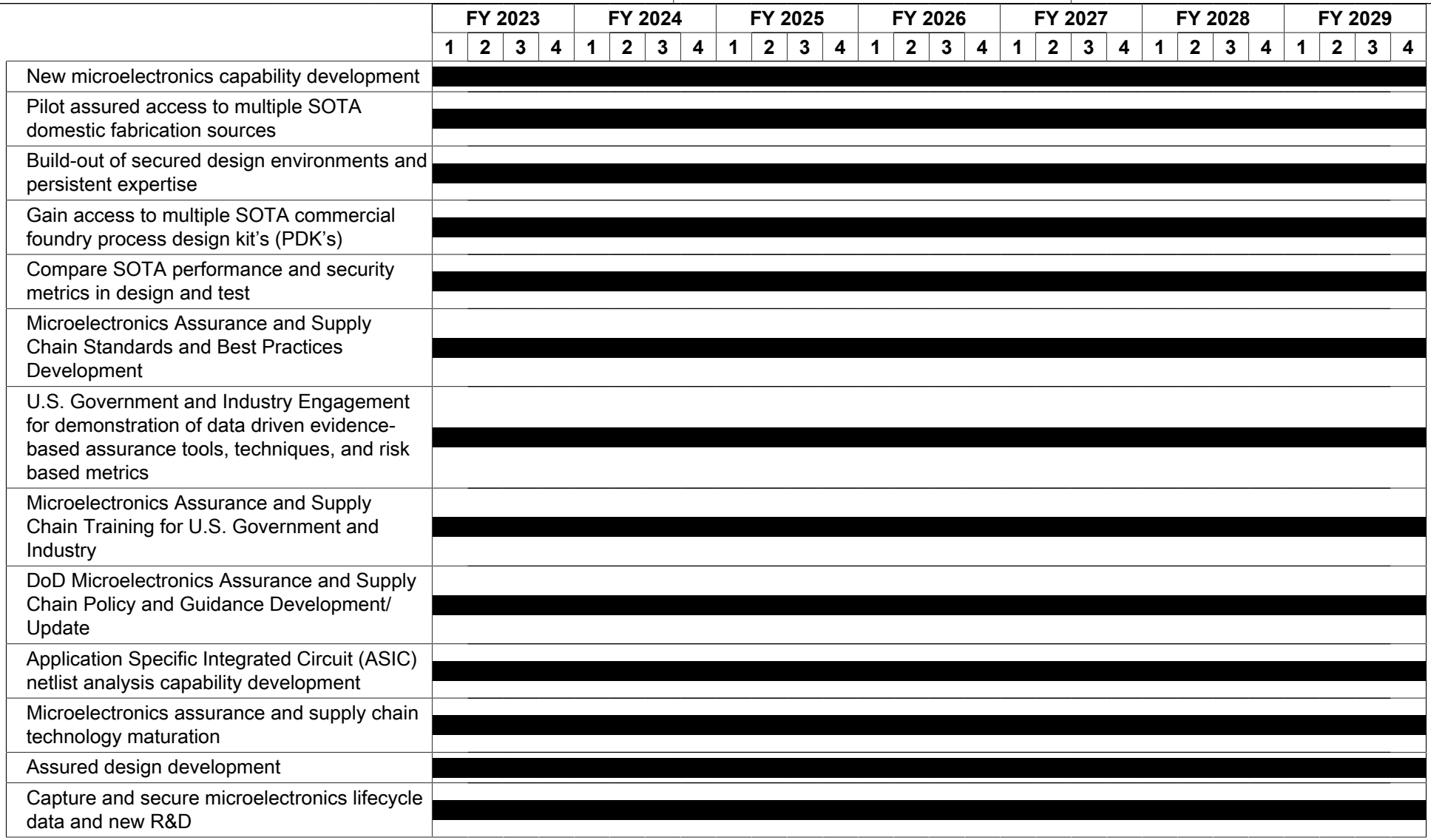


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

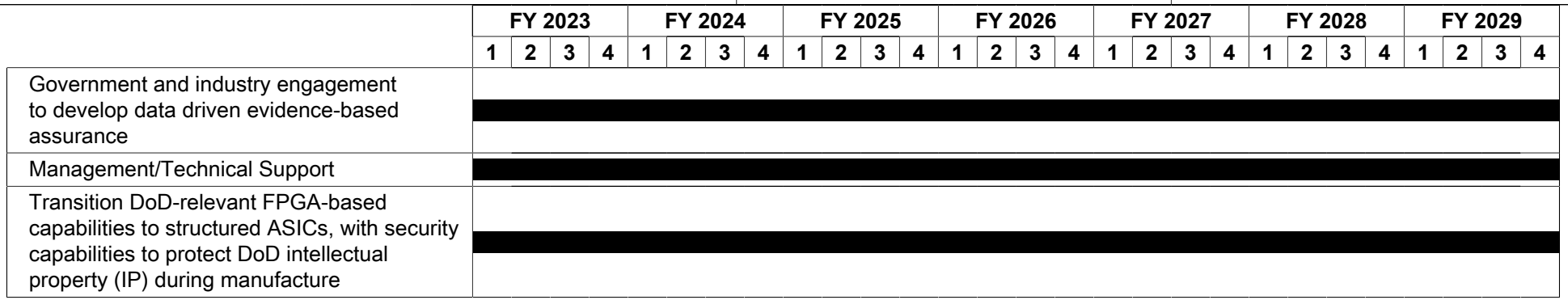


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Access to State-of-the-Art (SOTA) Microelectronics – Development				
Third Party Intellectual Property (IP) and electronic data automation (EDA) tool repository development	2	2021	4	2029
Access to SOTA commercial microelectronics technology through design and integration	2	2021	4	2029
New microelectronics capability development	2	2021	4	2029
Pilot assured access to multiple SOTA domestic fabrication sources	2	2021	4	2029
Build-out of secured design environments and persistent expertise	2	2021	4	2029
Gain access to multiple SOTA commercial foundry process design kit’s (PDK’s)	2	2021	4	2029
Compare SOTA performance and security metrics in design and test	2	2021	4	2029
Microelectronics Assurance and Supply Chain Standards and Best Practices Development	2	2021	4	2029
U.S. Government and Industry Engagement for demonstration of data driven evidence-based assurance tools, techniques, and risk based metrics	2	2021	4	2029
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry	2	2021	4	2029
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update	2	2021	4	2029
Application Specific Integrated Circuit (ASIC) netlist analysis capability development	2	2021	4	2029
Microelectronics assurance and supply chain technology maturation	2	2021	4	2029
Assured design development	2	2021	4	2029
Capture and secure microelectronics lifecycle data and new R&D	2	2021	4	2029
Government and industry engagement to develop data driven evidence-based assurance	2	2021	4	2029

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Management/Technical Support	2	2021	4	2029
Transition DoD-relevant FPGA-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture	2	2021	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense			Date: March 2024
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 908 / *Access to Advanced Packaging and Testing - Development*	

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
908: *Access to Advanced Packaging and Testing - Development*	153.781	68.221	90.199	92.404	-	92.404	91.055	63.751	65.278	66.700	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will leverage existing commercially available expertise and capability to deliver self-sustaining digital and Radio Frequency (RF) state-of-the-art (SOTA) heterogeneous integrated packaging (SHIP), assembly, and test capability.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Access to Advanced Packaging and Testing - Development	68.221	90.199	92.404

Description: This project will leverage heterogeneous integrated (HI) packaging technologies to accelerate adoption of the most advanced microelectronics available. Key technologies, processes and tools will be developed and improved upon, allowing DoD to utilize HI technologies to package chips and chiplets (small specialized die) to realize performance benefits. Working with world-class industrial partners will provide early access to proprietary information related to these technologies, giving DoD an asymmetrical advantage.

This project will deliver an on-shore microelectronic device package design, assembly, and test capability. It will provide access to dual-use SOTA heterogeneous packaged microelectronics and manufacturing processes. It will enable
Description: This project will utilize Description: This project will utilize Description: This project will leverage heterogeneous integrated (HI) packaging technologies to accelerate adoption of the most advanced microelectronics available. Key technologies, processes and tools will be developed and improved upon, allowing DoD to utilize HI technologies to package chips and chiplets (small specialized die) to realize performance benefits. Working with world-class industrial partners will provide early access to proprietary information related to these technologies, giving DoD an asymmetrical advantage.

This project will deliver an on-shore microelectronic device package design, assembly, and test capability. It will provide access to dual-use SOTA heterogeneous packaged microelectronics and manufacturing processes. It will enable personalization of, and customization for supporting DoD programs. It will enable a revolutionary leap in system performance that will greatly reduce size, weight and power (SWaP) by incorporating the immense advances in SOTA commercial off the shelf (COTS) processing technologies, such as field programmable gate arrays (FPGAs), microprocessors, and Graphic Processing Units (GPUs).

FY 2024 Plans:

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Continue the establishment of a state-of-the-art (SOTA) packaging and test facility capable of packaging, testing and personalization of integrated circuits in which the fully assembled and operationally functional multi-chip package (MCP) can contain International Traffic in Arms Regulations (ITAR) regulated and/or classified information. Continue to expand and accelerate development: • Continue to collaborate with the Defense Industrial Base for prototype design requirements and device transition planning. • Continue Implementation of post-assembly personalization and operational test capabilities. • Continue to Implement MCP finish capability for additional security to protect DoD specific intellectual property (IP) and critical program information (CPI) in the fully functional MCP. • Continue to accelerate access. • Continue to Enable re-shoring mature manufacturing, assembly, and test from commercial product lines such as high-volume flip-chip capabilities. • Continue to enable access to advanced radio frequency (RF) packages by providing a full suite of design tools, advanced packaging platforms, and a wide selection of material choices. • Continue to Accelerate defense industrial base (DIB) and DoD maturation leveraging commercial design using developed process design kits (PDKs) and assembly design kits (ADKs) to design custom devices. • Continue to Accelerate DoD access to SOTA MCP products utilizing commercial packaging, assembly, and test. • Continue to create a catalog of designs, die, chiplets, package types, etc. • Continue to Ensure Reuse and Standardization for sustainability and costs. • Continue to Accelerate and expand adoption & Use in military systems to design, packaging, and assembly as a service. • Continue to enhance secure design and packaging capability with new tools/techniques. • Continued development of secure, accessible, and cost effective SOTA heterogeneous integration (HI) design, assembly and test capability. • Continue to develop Advanced HI Prototype Platforms for Productization and Qualification test. • Continue to develop, and initiate qualifications of, packaging processes that source materials from domestic microelectronics ecosystem. • Continue to prototype microelectronics evidence-based assurance guidance for microelectronics heterogeneous integrated packaging. • Mature readiness of advanced HI packaging processes for initial production capability.			
FY 2025 Plans: Continue the establishment of, and accelerate access to, SOTA packaging and test facilities capable of packaging, testing and personalization of integrated circuits in which the fully assembled and operationally functional Multi-Chip Package (MCP) can contain ITAR regulated and/or classified information. Continue to ensure reuse and standardization for sustainability and			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
costs. Continue executing transition strategy through engagement with programs offices and DIB, data driven analyses, and risk reduction. Continue to expand and accelerate the development of: • Advanced packaging capability utilizing re-shored commercial manufacturing, assembly, domestically sourced materials, and test for productization and qualification. • Processes and capabilities to meet DoD's heterogeneous integration (HI) packaging unique design needs • Advanced radio frequency (RF) packaging design tools, process design kits (PDKs), assembly design kits (ADKs), and platforms using a wide selection of material choices. • A catalog of designs, die, chiplets, package types, etc. • Prototyping microelectronics evidence-based assurance guidance for microelectronics heterogeneous integrated packaging • Enhance secure design and packaging capability with new tools/techniques. • Post-assembly personalization and operational test capabilities. • MCP finish capability for additional security to protect DoD specific intellectual property (IP) and critical program information (CPI) in the fully functional MCP. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The increase of $2.018 million between FY 2024 and FY 2025 will mature readiness for initial production in an on-shore microelectronic device package design, assembly, and test capability, providing access to dual use state-of-the-art (SOTA) heterogeneous packaged microelectronics and manufacturing processes and enabling customization for supporting DoD programs.			
Accomplishments/Planned Programs Subtotals	68.221	90.199	92.404

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Funding increase of $.187 million FY 2025

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Access to Advanced Packaging and Testing - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	153.781	68.221	Mar 2023	90.199	Mar 2024	92.404	Mar 2025	-		92.404	Continuing	Continuing	-
		Subtotal	153.781	68.221		90.199		92.404		-		92.404	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.187 million FY- 2025 for Economic Assumptions

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	153.781	68.221		90.199		92.404		-		92.404	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.187 million FY 2025 for Economic Assumptions

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

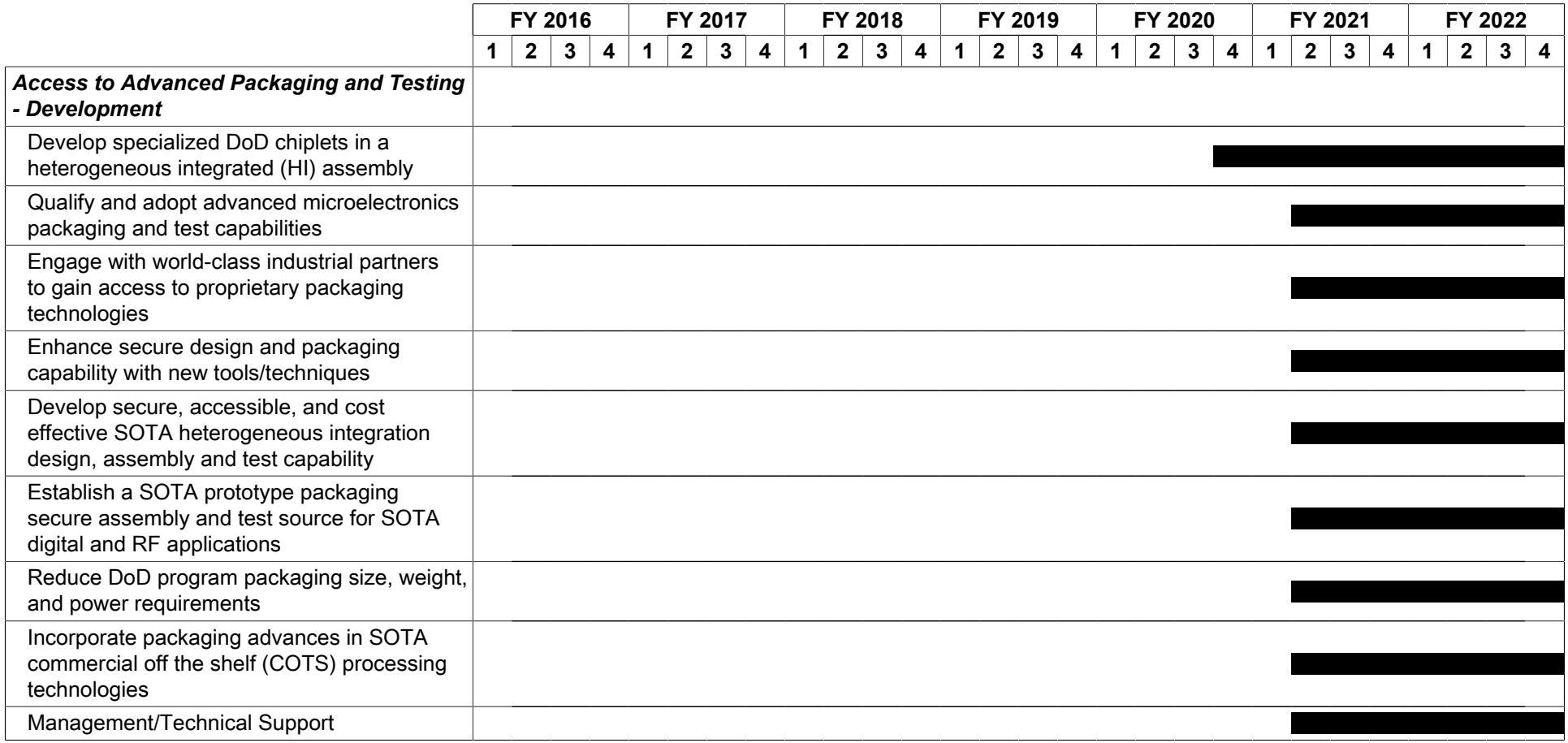


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

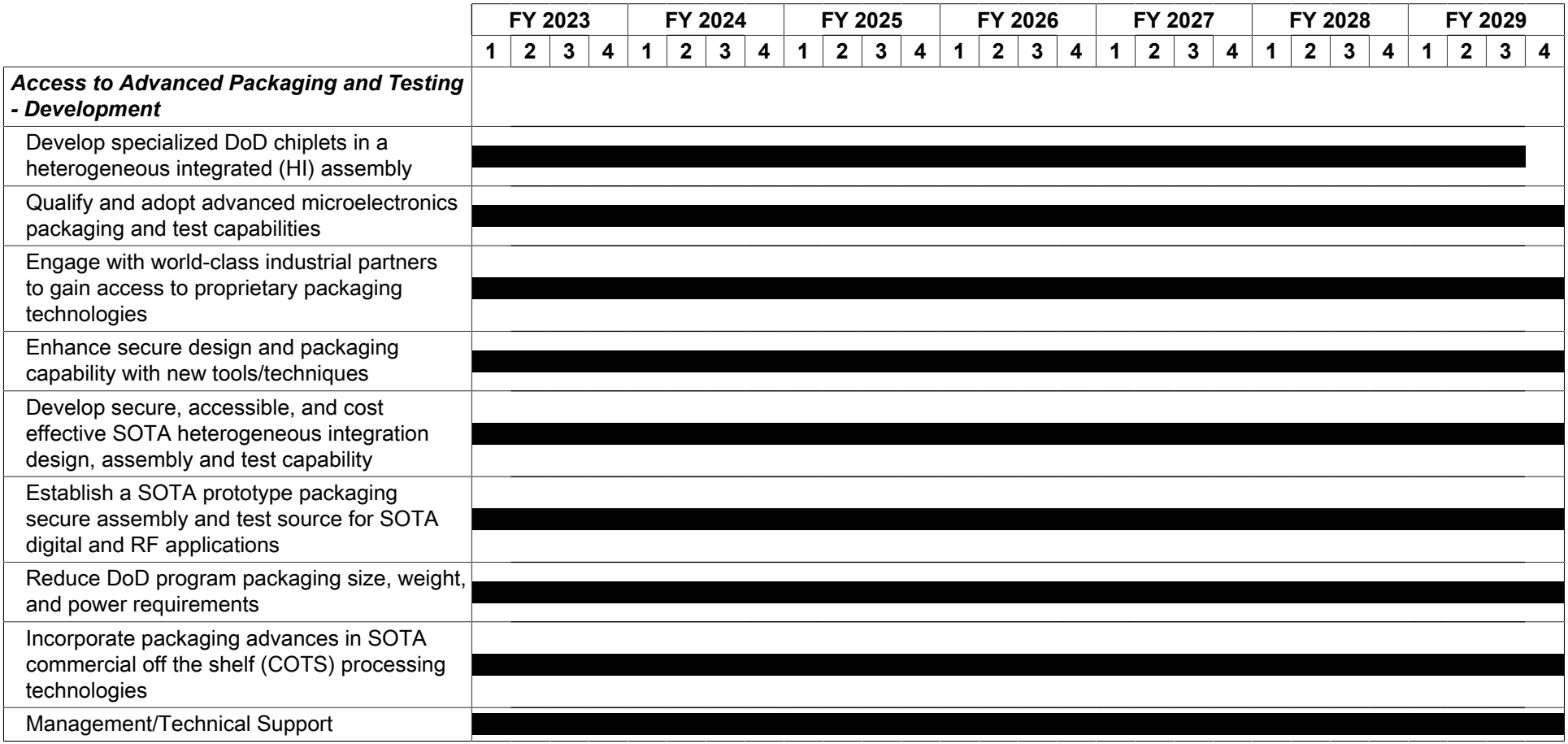


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Access to Advanced Packaging and Testing - Development				
Develop specialized DoD chiplets in a heterogeneous integrated (HI) assembly	4	2020	3	2029
Qualify and adopt advanced microelectronics packaging and test capabilities	2	2021	4	2029
Engage with world-class industrial partners to gain access to proprietary packaging technologies	2	2021	4	2029
Enhance secure design and packaging capability with new tools/techniques	2	2021	4	2029
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability	2	2021	4	2029
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications	2	2021	4	2029
Reduce DoD program packaging size, weight, and power requirements	2	2021	4	2029
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies	2	2021	4	2029
Management/Technical Support	2	2021	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense			Date: March 2024
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*	

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
911: *Access to Radiation Hardened RF and Opto-Electronic Development*	219.572	196.908	279.416	210.076	-	210.076	151.674	124.347	124.058	126.762	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project addresses the dual problems of commanding only a small market share while requiring an expansive range of unique microelectronics needs, from boutique and legacy components to state-of-the-art (SOTA) technologies. The Government must sustain specialty suppliers, given their criticality to national security. In particular, DoD needs access to a diverse microelectronics ecosystem to develop and acquire the application specific integrated circuits (ASICs) and personalized commercial off the shelf (COTS) components required for military radiation hardened and radio frequency (RF) and optoelectronic (OE) needs.

The Department frequently relies on commercial suppliers to optimize performance and reduce costs for sophisticated weapon system and secure network functionality. It is critical that DoD has reliable access to subject matter expertise, technology, and manufacturing.

In addition to radiation hardened microelectronics needs, the DoD requires access to RF and opto-electronic materials, foundries, and packaging facilities, in order to enable next generation sensors and communications. The DoD must leverage state-of-the-art microelectronic technologies driven by mega-trends such as 5G wireless and datacenters in order to combat emerging threats and deliver overmatch technology to the warfighter. At the same time, the DoD must fill the gaps which are left unaddressed by these dual-use mega-trends to satisfy mission requirements. By partnering in the maturation of state-of-the-art material sources, foundries, and packaging facilities, the DoD is able to develop the ability to tailor the dual use technology towards unique DoD applications and encourage open access design, which stimulates innovation and drives affordability. Additionally, critical investments must be made in the domestic supply chains supporting both RF Gallium Nitride (GaN) and integrated photonics in order to maintain the integrity and security of the Defense Industrial Base.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Access to Radiation Hardened-, RF-, and Opto-Electronic Development	120.408	279.416	210.076
Description: Government-unique trusted design and manufacturing flows have been developed to enable a tier of trust for select ASIC parts; however, this approach addresses only a small subset of DoD microelectronics requirements (e.g., processors, memory, microcontrollers, field programmable gate arrays (FPGAs), and radiation-tolerant processors). DoD will partner with the intelligence community, the Department of Energy, and the National Aeronautics and Space Administration to develop radiation hardened components that permit systems to operate in space and other harsh environments. state-of-the-practice (SOTP) and state-of-the-art (SOTA) technologies will be characterized and developed in support of Radiation Hardened By Process (RHBP) and Radiation Hardened By Design (RHBD) activities in support DoD modernization programs with radiation hardened requirements.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Beyond complementary metal-oxide semiconductor (CMOS) and radiation hardened microelectronics, radio frequency (RF)- and opto-electronic (RF/OE) technologies represent critically enable asymmetric DoD capabilities as well as domestic dual-use industrial base capabilities. RF/OE investments will develop and demonstrate RF Gallium Nitride (GaN) and integrated photonic material sources, foundries, packaging facilities. These investments will break microelectronics bottlenecks which directly enable compact millimeter wave transceivers and artificial intelligence training for edge compute. ***FY 2024 Plans:*** Planned activities are as follows: • Continue development of RHBD techniques in SOTA technologies with validated radiation aware PDKs and radiation hardened cell libraries • Transition developed RH technologies into space and strategic programs. • Continue to mature multiple manufacturing readiness level (MRL)-6 state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services, progressing toward MRL-7 • Continue to mature MRL-6 multiple co-packaged optical chiplets and multi-chip packages offering high-bandwidth data transfer capabilities. • Continue to mature MRL-6 advanced semiconductor material production and baseline for insertion into multiple millimeter wave foundries. • Establish workforce development program for RF, power, and photonics. • Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. • Continue to mature RHBP techniques in a state-of-the-practice (SOTP) foundry. • Increase capacity for RHBD technologies to support additional DoD programs. • Add second contractor to development effort for a strategic radiation-hardened Field Programmable Gate Array (FPGA) capability for DoD • Increase funding for Government Radiation Hardened System-on-a- Chip (GRADSoC) Phases 2 and 3 • Demonstrate design and process capability with radiation hard by design tested chip, TRL-6. • Two new sources of radiation hard by design enabling onboard processing capability with 100x capability improvement. • Maintain a mature portfolio of domestic RF GaN foundries, which offers open access to millimeter wave technology and product transition via the DoD Advanced Packaging ecosystem. • Demonstrate advanced integrated photonics prototypes via secure access to state-of-the-art domestic foundries. • Initiate development of next generation RF GaN power technologies to increase RF power efficiency and dramatically improve thermal efficiency and management, decreasing the power load on DoD platforms.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
• Initiate development of next generation radio frequency (RF) Gallium Nitride (GaN) prototypes with improved performance at an affordable cost for drop in Line Replaceable Units (LRUs) in existing systems potentially without major architectural and structural redesign. • Leverage commercial developments in next generation RF GaN power technologies to adapt for DoD applications. • Initiate effort to transition emerging memory architectures for artificial intelligence (AI) applications, benefiting existing Programs of Record and emerging DoD electronics systems. • Develop emerging memory architectures for future DoD edge applications for AI, with more severe power constraints as AI models grow in size and the need for rapid response means always-on is required. • Develop a two level memory (2LM) system where weights are stored in persistent memory to substantially reduce leakage power and allow larger AI models. • Initiate development of a custom intelligent data cache to enable rapid innovation for DoD workloads, freed from the memory access assumptions driven by the commercial market. • Initiate development of high voltage silicon carbide (SiC) technology for dense power delivery and high power (high voltage & high current) devices in ultra-compact, reliable, and efficient form factors. Successful development of this technology will enable improvements in output & efficiency (better power conversion with less loss for use in ship-to-shore power, DC transmission, and other integrated power systems), speed (reducing charging time for vehicles, aircraft, and other platforms from hours to minutes), and size (reducing size of high-voltage converters, drives and substations to a fraction of current volumes). • Develop capability to deliver of thick epitaxial SiC wafers at scale to enable high voltage, high current device development. • Research techniques to optimize advanced packaging design and testing for high power SiC technology. • Lay groundwork for device integration of high power SiC technology, including working with application and platform developers to integrate into higher level assemblies and mission-critical systems that require robust, energy-dense solid state power switching solutions. Continued characterization, development, and demonstration of space and strategic radiation hard microelectronics technology in support of DoD modernization efforts. These investments fund projects in the following rad hard technology areas: radiation hardened by process (RHBP) and radiation hardened by design (RHBD) to support space and strategic ASIC requirements, standalone radiation hardened components for cross -service common parts needs, as well as lab modernization in support independent validation and verification of rad hard technology. ***FY 2025 Plans:*** Planned activities are as follows: • Continue to mature multiple MRL-7 state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
• Continue to mature MRL-6 multiple co-packaged optical chiplets and multi-chip packages offering high-bandwidth data transfer capabilities. • Continue to mature manufacturing readiness level (MRL)-6 advanced semiconductor material production and baseline for insertion into multiple millimeter wave foundries. • Continue workforce development program for radio frequency (RF), power, and photonics. • Continue development of next generation RF Gallium Nitride (GaN) power technologies to increase RF power efficiency and dramatically improve thermal efficiency and management, decreasing the power load on DoD platforms. • Continue development of next generation RF GaN prototypes with improved performance at an affordable cost for drop in Line Replaceable Units (LRUs) in existing systems potentially without major architectural and structural redesign. Leverage commercial developments in next generation RF GaN power technologies to adapt for DoD applications. • Continue development of radiation hardened by design (RHBD) techniques in state-of-the-art (SOTA) technologies with validated radiation aware process design kits (PDKs) and radiation hardened cell libraries • Transition developed radiation hardened technologies into space and strategic programs. Initiate effort to transition emerging memory architectures for artificial intelligence (AI) applications, benefiting existing Programs of Record and emerging DoD electronics systems. • Develop emerging memory architectures for future DoD edge applications for AI, with more severe power constraints as AI models grow in size and the need for rapid response means always-on is required. • Continued characterization, development, and demonstration of space and strategic radiation hard microelectronics technology in support of DoD modernization efforts. These radiation hardened investments fund projects in the following rad hard technology areas: radiation hardened by process (RHBP) RHBD to support space and strategic application-specific integrated circuit (ASIC) requirements, standalone radiation hardened components for cross-service common parts needs, as well as lab modernization in support independent validation and verification of rad hard technology. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease of $69.763 million between FY 2024 and FY 2025 is the net result of a realignment of $89.106 million to the Mission Engineering and Integration (ME&I) PE 0603142D8Z that will support efforts to integrate data, tools, and techniques to speed delivery of capabilities to the warfighter, which is Building on our Enduring Advantages, a key goal of the National Defense Strategy, and a previously planned increase of $19.343 million.			
Accomplishments/Planned Programs Subtotals	120.408	279.416	210.076

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

	FY 2023	FY 2024
Congressional Add: GaN and GaAs RFIC technology ***FY 2023 Accomplishments:*** • Continued production demonstration of state-of-the-art (SOTA) radio frequency (RF) Gallium Nitride (GaN) devices and advanced interconnect components in a production relevant environment. • Continued demonstration of millimeter wave device designs/IP via open access to SOTA RF GaN nodes.	25.000	-
Congressional Add: Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics ***FY 2023 Accomplishments:*** Complementary Metal Oxide Semiconductor (CMOS) Silicon On Insulator (SOI) technology maturation, demonstration, and qualification for use in Department of Defense Space and Strategic system applications to include radiation aware Process Development Kits (PDKs), radiation hardened cell libraries, device and circuit modeling and simulation, hardware demonstration and environmental test in DoD relevant radiation environments.	38.000	-
Congressional Add: Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology ***FY 2023 Accomplishments:*** Advanced Complementary Metal Oxide Semiconductor (CMOS) Silicon On Insulator (SOI) research and development, technology maturation, and prototype demonstration for use in Department of Defense Space and Strategic system applications to include radiation aware Process Development Kits (PDKs), radiation hardened cell libraries, device and circuit modeling and simulation, hardware demonstration and environmental test in DoD relevant environments. Demonstrations to include use of advanced commercial CMOS SOI technology for use in hardened configurable logic and system in package prototypes. Development of design intellectual property (IP) generation models for critical semiconductor industrial base sustainment and growth, IP affordability, and asymmetric advantage for the DoD.	10.000	-
Congressional Add: Magnetoresistive Random Access Memory (MRAM) ***FY 2023 Accomplishments:*** Magnetoresistive random access memory (or MRAM) technology has several aspects that make it attractive for DoD use, including a high inherent tolerance to radiation and nearly unlimited read and write endurance. Activities included: • Fostering industrial competition of this technology • Accelerating ongoing development activities for MRAM, with a goal of creating more advanced and capable memory technology than is currently available.	3.500	-
Congressional Adds Subtotals	76.500	-

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.423 million FY 2025, ($2.035 million FY 2025-2029) for Economic Assumptions.

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Address DoD Unique Needs - Development	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	219.572	196.908	Mar 2023	279.416	Mar 2024	210.076	Mar 2025	-		210.076	Continuing	Continuing	-
		Subtotal	219.572	196.908		279.416		210.076		-		210.076	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.423 million FY 2025 for Economic Assumptions.

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	219.572	196.908		279.416		210.076		-		210.076	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers
2) Funding increase of $.423 million FY 2025 for Economic Assumptions.

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

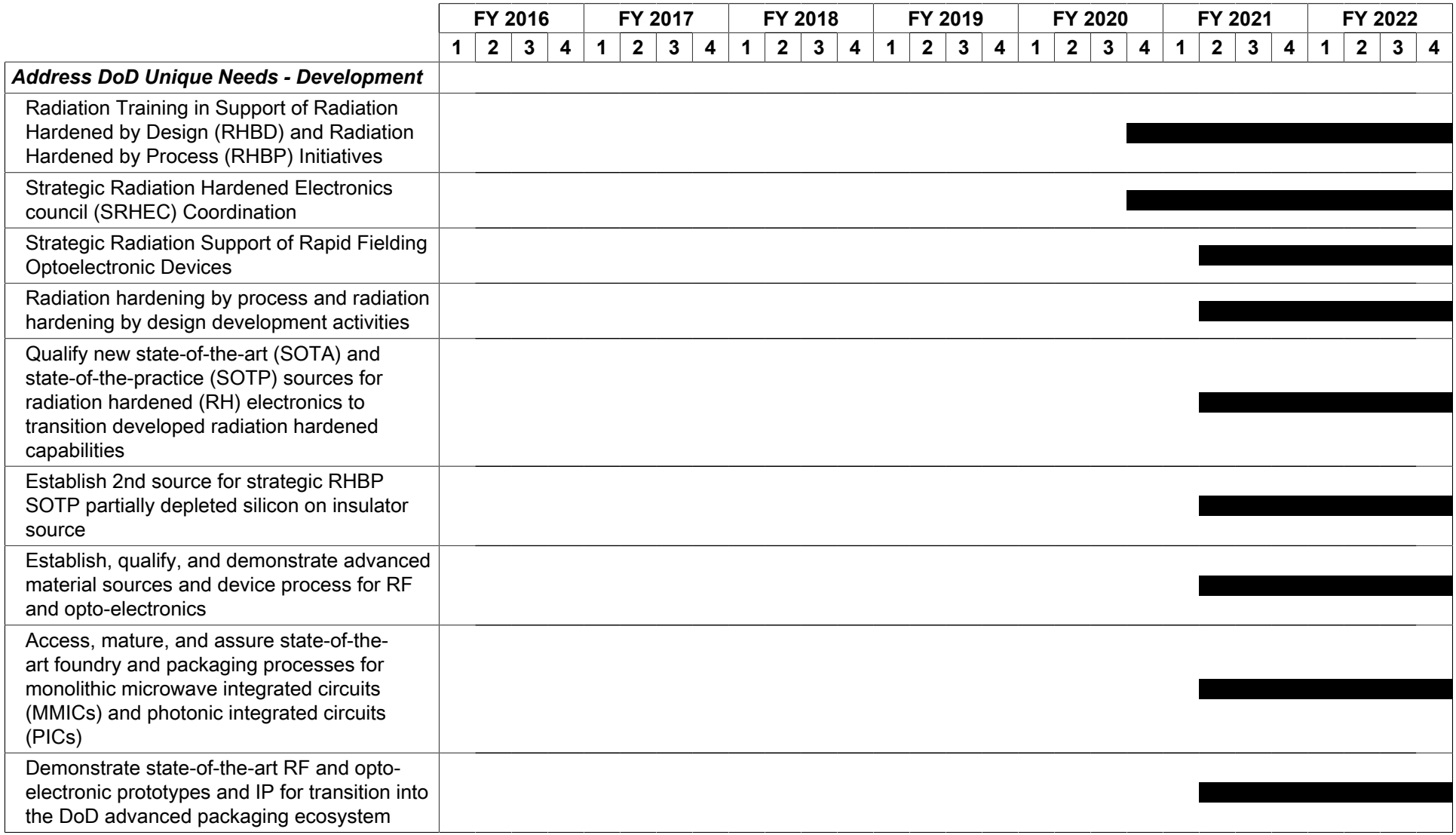


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

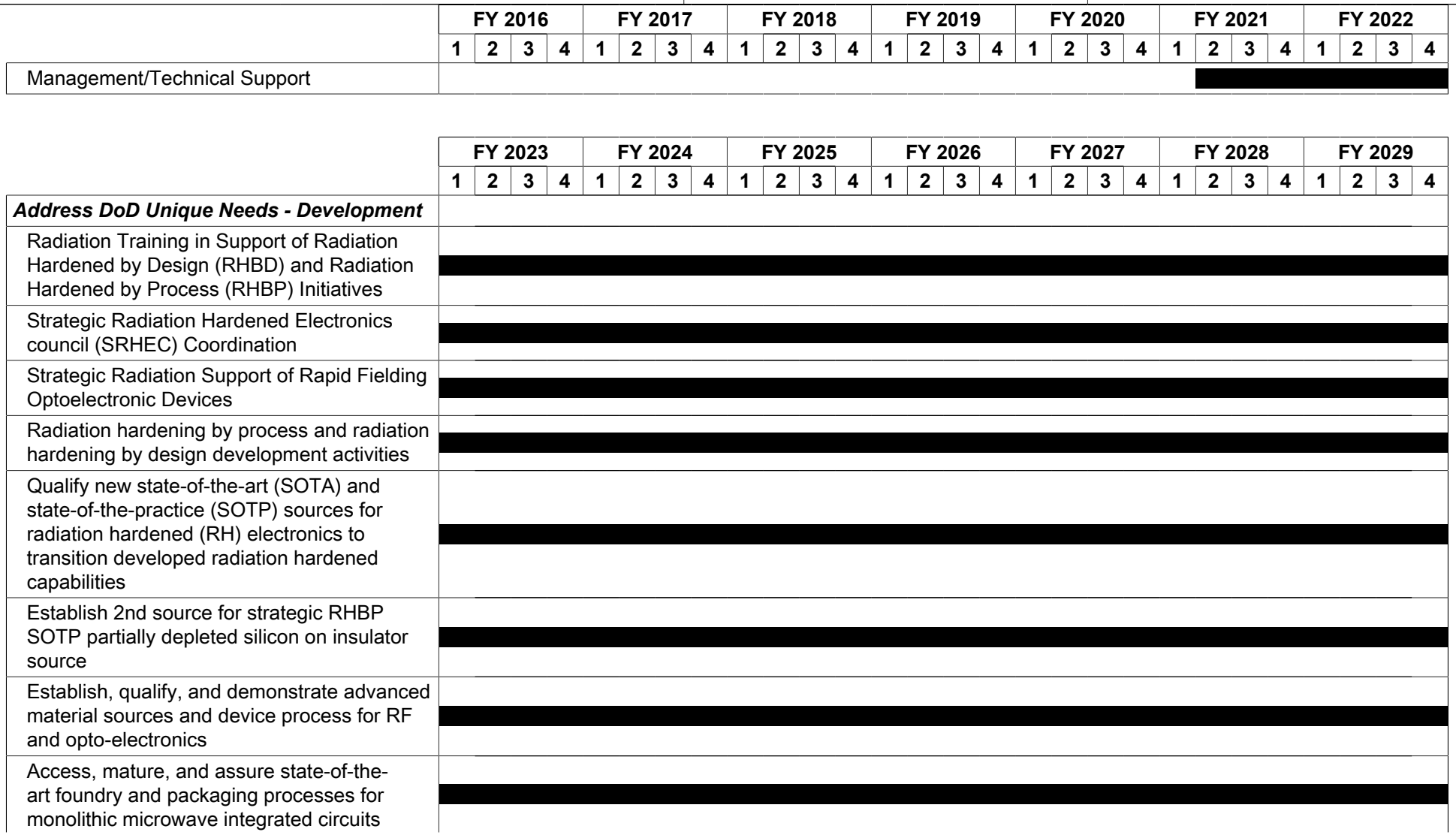


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

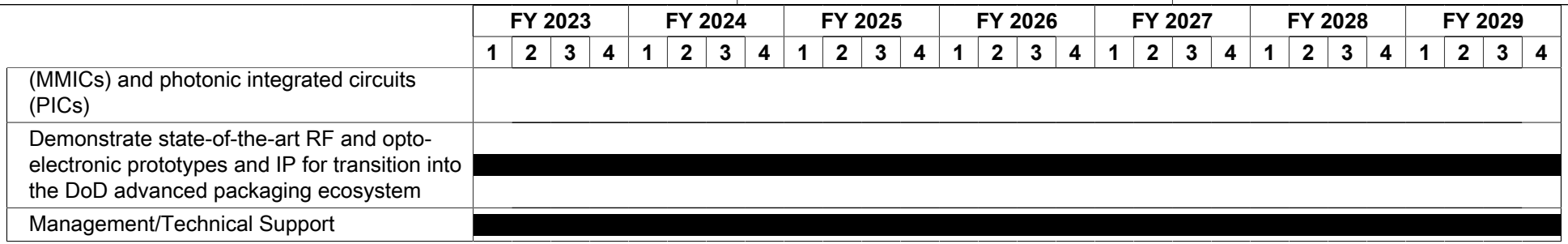


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Access to Radiation Hardened RF and Opto-Electronic Development*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Address DoD Unique Needs - Development				
Radiation Training in Support of Radiation Hardened by Design (RHBD) and Radiation Hardened by Process (RHBP) Initiatives	4	2020	4	2029
Strategic Radiation Hardened Electronics council (SRHEC) Coordination	4	2020	4	2029
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices	2	2021	4	2029
Radiation hardening by process and radiation hardening by design development activities	2	2021	4	2029
Qualify new state-of-the-art (SOTA) and state-of-the-practice (SOTP) sources for radiation hardened (RH) electronics to transition developed radiation hardened capabilities	2	2021	4	2029
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source	2	2021	4	2029
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics	2	2021	4	2029
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)	2	2021	4	2029
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem	2	2021	4	2029
Management/Technical Support	2	2021	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense			Date: March 2024
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*	

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
912: *Create an Evidence-Based Assured Microelectronics Pipeline*	112.544	92.401	126.081	130.694	-	130.694	129.107	110.420	88.759	90.745	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will promote microelectronics innovation and create an evidence-based assured Microelectronics pipeline including continuing Joint Federated Assurance Center (JFAC) strategic partnerships, assuring field programmable gate array (FPGA) devices, supplier chain awareness and security, and workforce development. It will slow and in the long-term reverse offshoring trends by fostering commercial and Government alliances to preserve the U.S. ecosystem, lower barriers to innovation and adoption, strengthen workforce expertise, and ensure DoD has access to the next generation of advanced technology by utilizing an evidence-based assurance approach. This approach enables management of microelectronics security that is commensurate with program risk throughout the product pipeline and maintain the United States as the global source for high- end, secure, and reliable microelectronics components.

In addition, this project will develop a new data driven risk-based assurance paradigm for supply chain protection. This paradigm will strengthen security w3.5hile improving access, without exposing sensitive intellectual property (IP) to the foundry and requiring post-manufacture validation of foundry products. The enhancement will develop evidence-based assured design concepts in manufactured systems, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that IP protections meet or exceed current National Security Agency standards for IP protection, and to develop DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Create an Evidence-Based Assured Microelectronics Pipeline – Development	92.401	126.081	130.694
Description: DoD is investing in next-generation disruptive technology, leveraging U.S. innovation, and transitioning materials, architectures, and designs into prototype capabilities for use by multiple industrial sectors. This and additional targeted investments in workforce will begin to address long-term talent needs. In addition, the Department will continue to enhance its partnership with industry to mitigate supply chain risks. Significant increases in assurance and protection of DoD technical data and components will be achieved through improvements in design practices, modern commercial security practices, and advanced packaging and chain of custody technologies. This activity, along with continued engagements and partnerships with industry will foster necessary security features in commercial products and infrastructure that will facilitate long-term assured access for the U.S. Government to commercial advanced state-of-the-art (SOTA) technology providers.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
This project funds the operation hardware assurance (HwA) support to DoD programs and organizations of the Joint Federated Assurance Center (JFAC), established in National Defense Authorization Act (NDAA) Sec 937, to increase DoD's HwA by providing engineering tools, technical services, best practices, innovative technologies and other assistance to programs to detect, assess, prioritize, and mitigate vulnerabilities from hardware attacks and assurance against supply chain exploitation vulnerabilities. The JFAC will provide capabilities for programs to keep assessment findings throughout the life cycle of their systems for data mining (e.g., documentation on rationale for previous mitigation decisions). The collaboration between the JFAC and program offices will help mitigate existing and emerging critical threats and vulnerabilities in hardware available to all DoD programs. DoD is required to establish assured supply chain and operational security standards for the purchase of all (Commercial and Custom) microelectronics and protection of Intellectual Property across the entire lifecycle. An evidence-based assurance approach addresses FY 2020 NDAA Sec 224 requirement for trusted supply chain and operational security standards. Accelerate the adoption of an evidence-based assurance approach with multiple DoD pilot programs. This includes developing program guidance on baseline threats and mitigations per required level of assurance. This requires working closely with commercial industry, the defense industrial base and government JFAC subject matter experts. ***FY 2024 Plans:*** • Continue development of DoD program relevant application prototypes. • Cultivate a replicable and scalable Public-Private-Academic Partnership (PPAP) model to attract Science, Technology, Engineering, and Mathematics (STEM) students into trusted and assured microelectronics (T&AM) fields of study • Develop a clearable, knowledgeable workforce to support and execute DoD program workforce modernization needs in microelectronics • Obtain and Maintain an agile and adaptive workforce that meets current, as well as future, DoD needs • Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security. • Continue development of industry outreach strategy to address critical technologies identified by DoD assurance and intelligence analysis. Sharing developed technical threat information with industry partners. • Expand HwA laboratory tools and capabilities to keep pace with emerging commercial developments • Increase funding for supply chain analysis and engagement with the U.S. Semiconductor industry to mitigate supply chain threats • Enable and accelerate maturation and adoption of an evidence-based assurance approach • Mature a regulatory and policy framework to enable long-term access to assured legacy and SOTA microelectronics. Extend access. Evaluate, mature, and improve assurance practices.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
• Ensure approach is aligned as part of DoD's comprehensive systems security engineering (SSE) framework. Trusted Systems and Networks (TSN) Analysis. Component level – FY 2020 NDAA Section 224 response for custom and commercial microelectronics. • Use pilot projects to mature threat driven risk-based decision making models. • Leverages existing efforts. DoD policy, guidance, threat identification efforts, analysis and response, mitigations, technical efforts. Commercial standards and best practices. Proactive Technology Analysis. • Supports breadth of DoD microelectronics. Custom – Custom Integrated Circuit (CIC) and Field Programmable Gate Array (FPGA). Commercial – Commercial Off The Shelf (COTS) and modified commercial components. • Provide engineering and foreign language expertise to the counterintelligence community to support collection, analysis, investigations, and operations related to the DoD and US Government supply chains and foreign intelligence entity (FIE) threats to semiconductor-related equities. • Develop the counterintelligence portal for semiconductor analysis and mitigations (CSPAM) tool to share raw and finished intelligence analysis, intelligence collection, and threat data relating to the semiconductor industry within the law enforcement, counterintelligence, and intelligence communities, as well as key government stakeholders. • Conduct a semiconductor familiarization training program for intelligence and counterintelligence personnel and integrate into their established research, development, and acquisition (RDA) training plans. • Perform foreign technology analysis of emerging technologies for the counterintelligence and intelligence communities, to determine semiconductor industry sub-sectors, companies, or technologies that might be the targets of FIE activities, and which foreign companies might be the beneficiaries of foreign targeting.			
FY 2025 Plans: • Continue development of DoD program relevant application prototypes. • Expand number of Joint Federated Assurance Center (JFAC) hardware assurance (HwA) labs that have capabilities which complement existing analytical services. • Conduct proactive Validations & Verification (V&V) on FPGA families • Provide technical and analytical support to Military Global Positioning System (GPS) User Equipment (MGUE) program. Level of support dependent on MGUE requirements. • Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security. • Continue development of industry outreach strategy to address critical technologies identified by DoD assurance and intelligence analysis. Sharing developed technical threat information with industry partners.			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
• Continue to provide engineering and foreign language expertise to the counterintelligence community to support collection, analysis, investigations, and operations related to the DoD and US Government supply chains and foreign intelligence entity (FIE) threats to semiconductor-related equities. • Continue development of the counterintelligence portal for semiconductor analysis and mitigations (CSPAM) tool to share raw and finished intelligence analysis, intelligence collection, and threat data relating to the semiconductor industry within the law enforcement, counterintelligence, and intelligence communities, as well as key government stakeholders. • Continue the semiconductor familiarization training program for intelligence and counterintelligence personnel and integrate into their established research, development, and acquisition (RDA) training plans. • Continue to perform foreign technology analysis of emerging technologies for the counterintelligence and intelligence communities, to determine semiconductor industry sub-sectors, companies, or technologies that might be the targets of FIE activities, and which foreign companies might be the beneficiaries of foreign targeting. • Expand hardware assurance (HwA) laboratory tools and capabilities to keep pace with emerging commercial developments • Continue conducting supply chain risk-analysis and engagements with the U.S. Semiconductor industry to mitigate supply chain threats • Enable and accelerate maturation and adoption of an evidence-based assurance approach • Mature a regulatory and policy framework to enable long-term access to assured legacy, State-of-the-Practice (SOTP), and SOTA microelectronics. This includes tasks to: Extend access, Evaluate, mature, and improve assurance practices. • Ensure evidence-based assurance approach is aligned with DoD's comprehensive systems security engineering (SSE) framework. This includes: Trusted Systems and Networks (TSN) Analysis and Component level – FY 2020 NDAA Section 224 response for custom and commercial microelectronics. • Use pilot projects to mature threat driven risk-based decision making models. • Leverage existing efforts, including DoD policy, guidance, threat identification efforts, analysis and response, mitigations, technical efforts, Commercial standards and best practices, and Proactive Technology Analysis. • Support breadth of DoD microelectronics, including Custom – Custom Integrated Circuit (CIC), Field Programmable Gate Array (FPGA), and Commercial – Commercial Off The Shelf (COTS) and modified commercial components. • Cultivate a replicable and scalable Public-Private-Academic Partnership (PPAP) model to attract Science, Technology, Engineering, and Mathematics (STEM) students into trusted and assured microelectronics (T&AM) fields of study Use outreach and curriculum guidance programs for K-12 education, STEM instruction at bachelor's degree and advanced degree levels, and continuing workforce training efforts to: • Develop a clearable, knowledgeable workforce to support and execute DoD program workforce modernization needs in microelectronics, and • Obtain and maintain an agile and adaptive workforce that meets current, as well as future, DoD needs			
FY 2024 to FY 2025 Increase/Decrease Statement:			

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
The increase of $4.393 million between FY 2024 and FY 2025 will fund additional capacity for hardware verification and validation in DoD labs, supply chain analysis, and HwA efforts.			
Accomplishments/Planned Programs Subtotals	92.401	126.081	130.694

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

Funding increase of $.264 million FY 2025 ($1.268 million FY 2025-2029) for Economic Assumptions.

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Create an Evidence-Based Assured Microelectronics Pipeline	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	112.544	92.401	Mar 2023	126.081	Mar 2024	130.694	Mar 2025	-		130.694	Continuing	Continuing	-
		Subtotal	112.544	92.401		126.081		130.694		-		130.694	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers.
2) 2) Funding increase of $.264 million FY 2025 for Economic Assumptions.

	Prior Years	FY 2023		FY 2024		FY 2025 Base		FY 2025 OCO		FY 2025 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	112.544	92.401		126.081		130.694		-		130.694	Continuing	Continuing	N/A

Remarks

1) Updated FY 2023 Actuals, incorporating PB25 changes that include cancelled account and SBIR/STTR Transfers

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

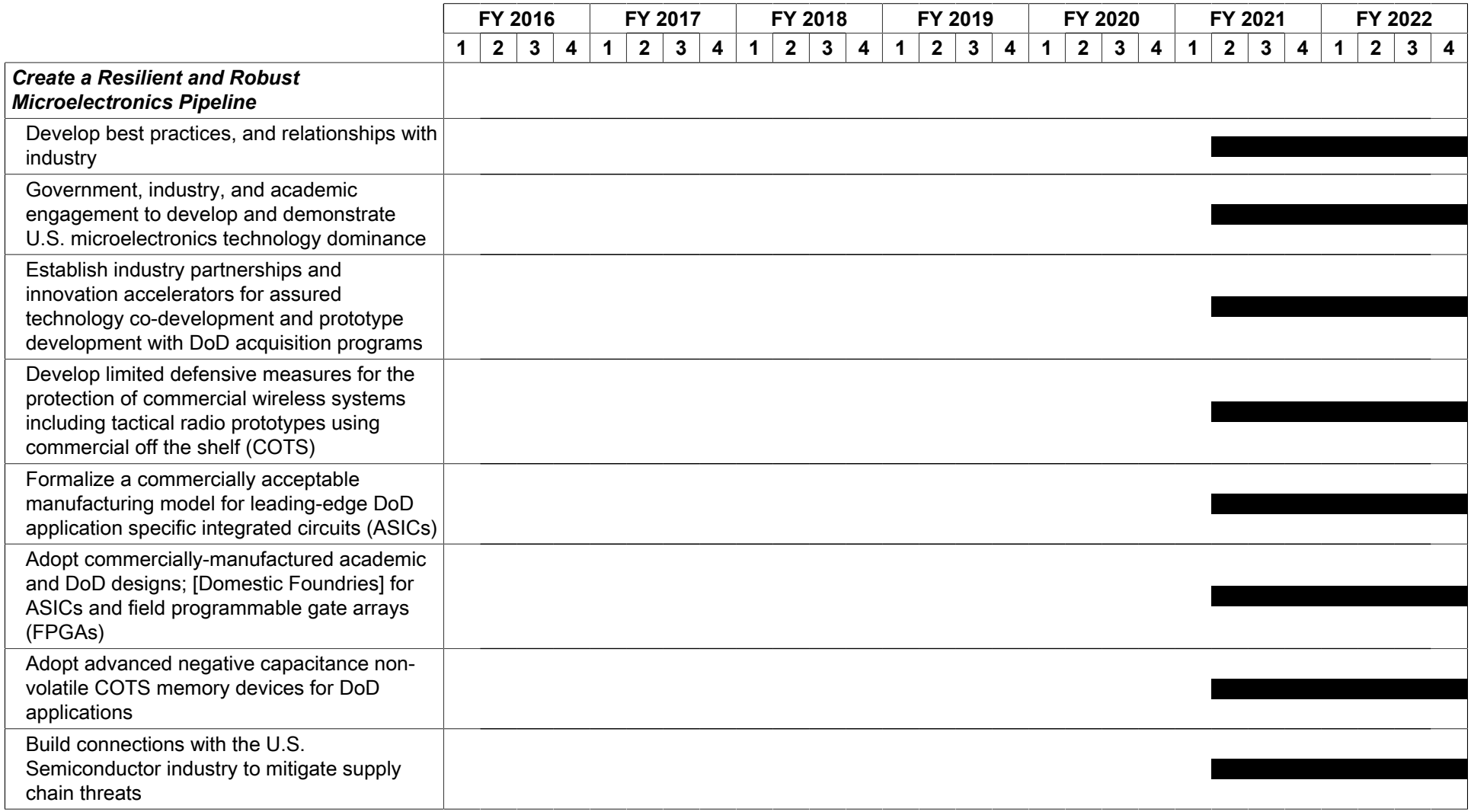


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

	FY 2016				FY 2017				FY 2018				FY 2019				FY 2020				FY 2021				FY 2022			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Develop tools to analyze the health of the supply chain and track the health of the U.S. industry																												
Management/Technical Support																												
Development of DoD program relevant application prototypes																												
Develop a clearable, knowledgeable workforce to support and execute DoD program workforce modernization needs in microelectronics																												
Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security																												
Microelectronics Assurance and Supply Chain Standards and Best Practices Development																												
U.S. Government and Industry Engagement for demonstration of data driven evidence-based assurance tools, techniques, and risk-based metrics																												
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry																												
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/ Update																												
Application Specific Integrated Circuit (ASIC) netlist analysis capability development																												
Field programmable gate array (FPGA) analyses tool development																												

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

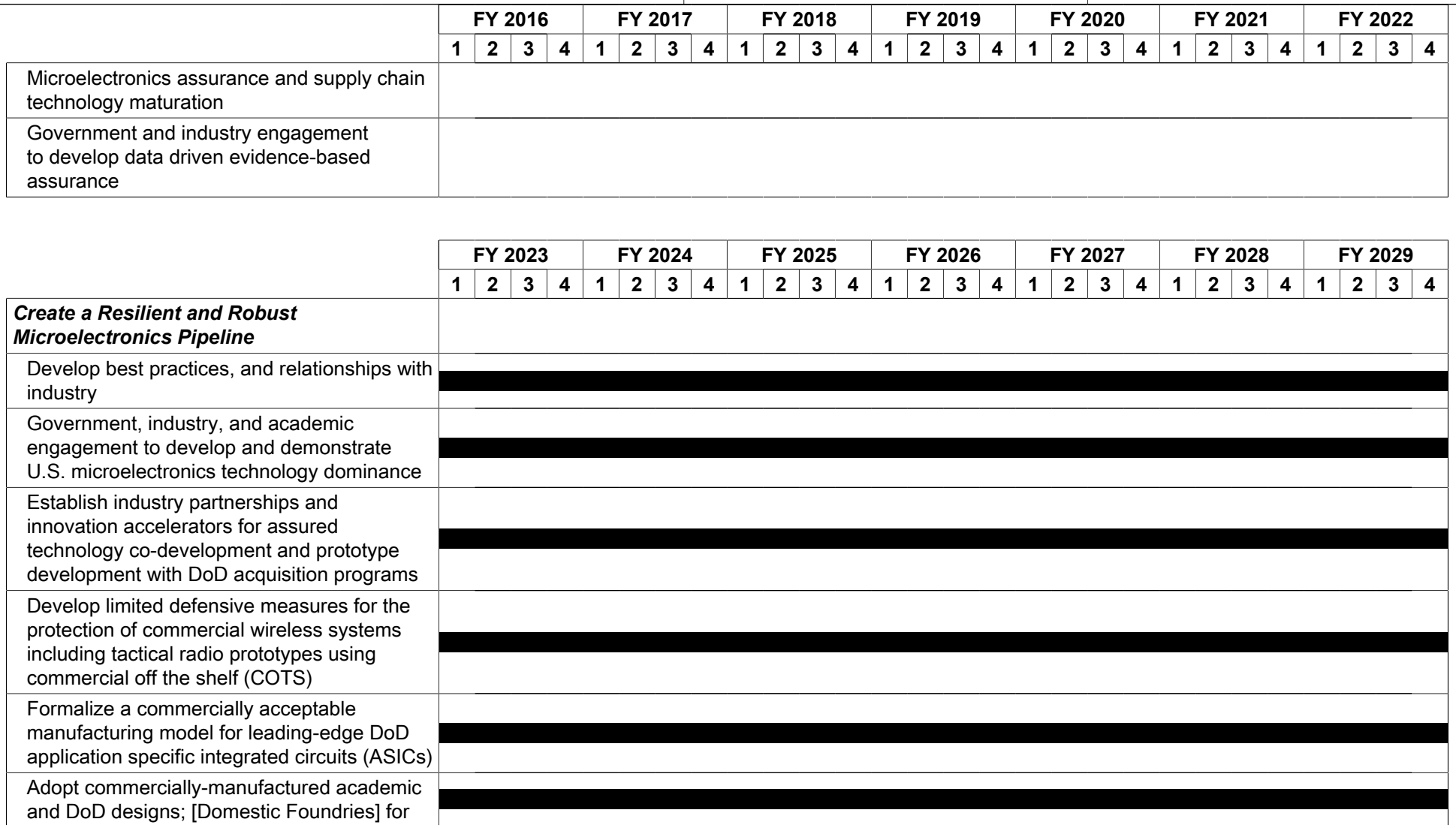


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

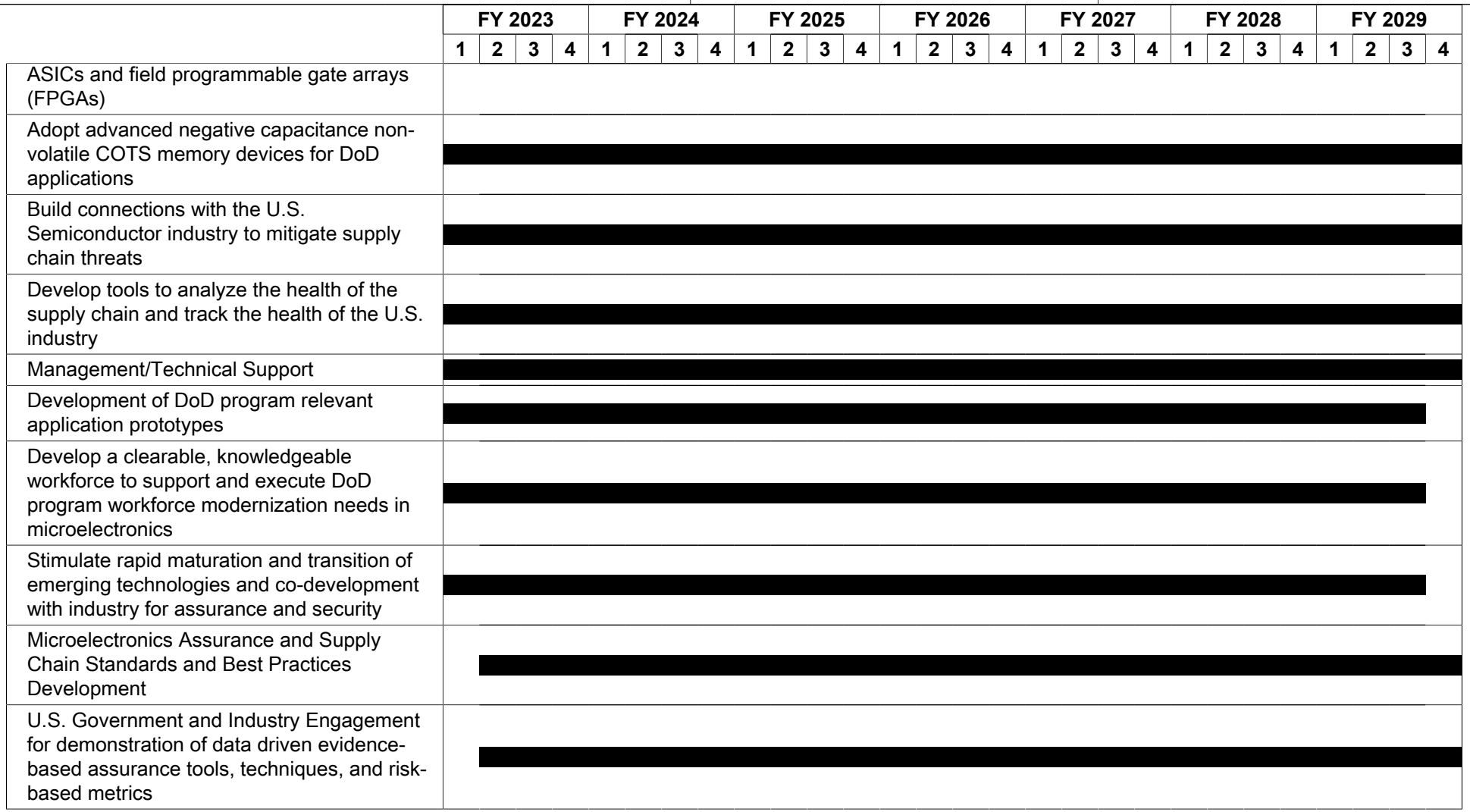


Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

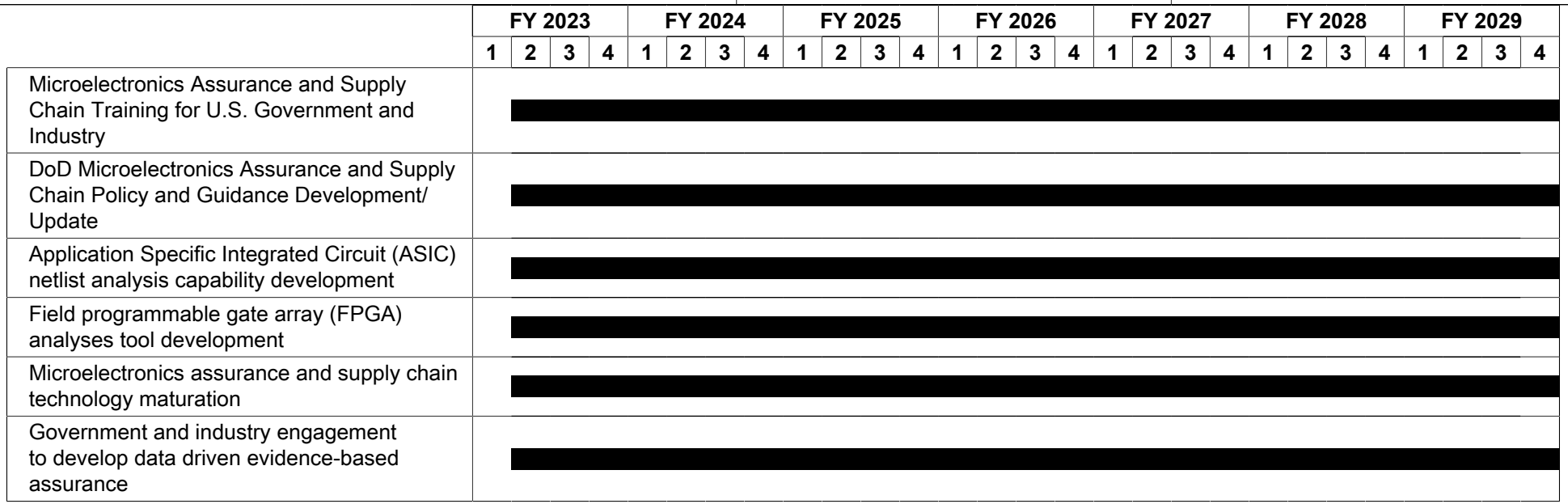


Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Create a Resilient and Robust Microelectronics Pipeline				
Develop best practices, and relationships with industry	2	2021	4	2029
Government, industry, and academic engagement to develop and demonstrate U.S. microelectronics technology dominance	2	2021	4	2029
Establish industry partnerships and innovation accelerators for assured technology co-development and prototype development with DoD acquisition programs	2	2021	4	2029
Develop limited defensive measures for the protection of commercial wireless systems including tactical radio prototypes using commercial off the shelf (COTS)	2	2021	4	2029
Formalize a commercially acceptable manufacturing model for leading-edge DoD application specific integrated circuits (ASICs)	2	2021	4	2029
Adopt commercially-manufactured academic and DoD designs; [Domestic Foundries] for ASICs and field programmable gate arrays (FPGAs)	2	2021	4	2029
Adopt advanced negative capacitance non-volatile COTS memory devices for DoD applications	2	2021	4	2029
Build connections with the U.S. Semiconductor industry to mitigate supply chain threats	2	2021	4	2029
Develop tools to analyze the health of the supply chain and track the health of the U.S. industry	2	2021	4	2029
Management/Technical Support	2	2021	4	2029
Development of DoD program relevant application prototypes	2	2021	3	2029
Develop a clearable, knowledgeable workforce to support and execute DoD program workforce modernization needs in microelectronics	2	2021	3	2029
Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security	2	2021	3	2029

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create an Evidence-Based Assured Microelectronics Pipeline*

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Microelectronics Assurance and Supply Chain Standards and Best Practices Development	2	2023	4	2029
U.S. Government and Industry Engagement for demonstration of data driven evidence-based assurance tools, techniques, and risk-based metrics	2	2023	4	2029
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry	2	2023	4	2029
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update	2	2023	4	2029
Application Specific Integrated Circuit (ASIC) netlist analysis capability development	2	2023	4	2029
Field programmable gate array (FPGA) analyses tool development	2	2023	4	2029
Microelectronics assurance and supply chain technology maturation	2	2023	4	2029
Government and industry engagement to develop data driven evidence-based assurance	2	2023	4	2029

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense			Date: March 2024
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 913 / *Defense Microelectronics Cross-Functional Team Funding*	

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
913: *Defense Microelectronics Cross-Functional Team Funding*	0.000	3.924	4.023	0.000	-	0.000	0.000	0.000	0.000	-	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

The decrease of $4.023 million between FY 2024 and FY 2025 is due to the scheduled sunset of this program after FY 2024.

A. Mission Description and Budget Item Justification

Microelectronics components are the foundation of modern military systems. The Department of Defense (DoD) is exposed to various vulnerabilities that threaten the ability to source microelectronics needed to sustain programs of record. To prepare the Department for Great Power Competition, the DoD must take action to ensure access to the microelectronic components needed to sustain our defense programs and systems effectively and affordably. The Department also needs a better strategy to transition leading edge technology developed by both government and industry to DoD programs of record, to ensure the Department maintains a competitive edge.

B. Accomplishments/Planned Programs ($ in Millions)	FY 2023	FY 2024	FY 2025
Title: Defense Microelectronics Cross-Functional Team Funding	3.924	4.023	0.000
Description: A Cross-Functional Team (CFT) was established effective January 2021 to develop a DoD strategy and implementation and transition plan to minimize vulnerabilities within the Department's microelectronic supply chain. The transition plan will be comprehensive, and include a budget plan. The CFT will function as an advisory body to the Deputy Secretary of Defense (DSD), the Under Secretary of Defense for Research and Engineering (USD(R&E)), the Under Secretary of Defense for Acquisition and Sustainment (USD(A&S)) to strengthen the domestic microelectronics supply chain. ***FY 2024 Plans:*** The CFT will continue to detail subject matter experts from the Services to the CFT and execute contracts for studies to supply the analysis necessary to inform the DoD strategy development. ***FY 2025 Plans:*** None. ***FY 2024 to FY 2025 Increase/Decrease Statement:*** The decrease of $4.023 million between FY 2024 and FY 2025 is due to the scheduled sunset of this program after FY 2024.			
Accomplishments/Planned Programs Subtotals	3.924	4.023	0.000

Exhibit R-2A, RDT&E Project Justification: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 913 / *Defense Microelectronics Cross-Functional Team Funding*

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 913 / *Defense Microelectronics Cross-Functional Team Funding*

Management Services ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Microelectronics Cross-Functional Team Funding	MIPR	TBD : TBD	-	3.924	Apr 2023	4.023	Apr 2024	0.000		-		0.000	Continuing	Continuing	-
		Subtotal	-	3.924		4.023		0.000		-		0.000	Continuing	Continuing	N/A

	Prior Years	FY 2023 Cost	FY 2023 Award Date	FY 2024 Cost	FY 2024 Award Date	FY 2025 Base Cost	FY 2025 Base Award Date	FY 2025 OCO Cost	FY 2025 OCO Award Date	FY 2025 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	3.924		4.023		0.000		-		0.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 913 / *Defense Microelectronics Cross-Functional Team Funding*

	FY 2023				FY 2024				FY 2025				FY 2026				FY 2027				FY 2028				FY 2029			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Defense Microelectronics Cross-Functional Team Funding																												
Program Support					[redacted]																							

Exhibit R-4A, RDT&E Schedule Details: PB 2025 Office of the Secretary Of Defense		Date: March 2024
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 913 / *Defense Microelectronics Cross-Functional Team Funding*

Schedule Details

	Start		End	
Events by Sub Project	**Quarter**	**Year**	**Quarter**	**Year**
Defense Microelectronics Cross-Functional Team Funding				
Program Support	2	2023	4	2024