Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
Total Program Element	1,199.177	489.251	704.091	647.226	0.000	647.226	662.282	584.378	575.319	547.581	Continuing	Continuing
907: *Access to State-of-the-Art (SOTA) Microelectronics - Development*	1,199.177	281.769	395.976	362.558	0.000	362.558	313.905	280.511	276.170	262.858	Continuing	Continuing
908: *Access to Advanced Packaging and Testing - Development*	0.000	81.438	112.343	56.118	0.000	56.118	0.000	0.000	0.000	0.000	Continuing	Continuing
911: *Address DoD Unique Needs - Radiation Hardening and non-CMOS*	0.000	50.500	169.072	107.003	0.000	107.003	154.852	136.718	134.642	128.150	Continuing	Continuing
912: *Create a Quantifiably Assured-Microelectronics Pipeline*	0.000	75.544	26.700	113.547	0.000	113.547	189.525	167.149	164.507	156.573	Continuing	Continuing
913: *Defense Microelectronics Cross-Functional Team Funding*	-	0.000	0.000	8.000	-	8.000	4.000	0.000	0.000	0.000	Continuing	Continuing

Note

New Start (Y/N): No

Beginning in FY 2021 Program Element (PE) funding was realigned under four new project codes to correctly align PE funding in support of the Quantifiable Assurance method and reflective of current priorities. The new project codes are: (1) P907 Access to State-of-the-Art (SOTA) Microelectronics - Development; (2) P908 Access to Advanced Packaging and Testing - Development; (3) P911 Address the Department of Defense (DoD) Unique Needs - Radiation Hardening and non-CMOS - Development; and (4) P912 Create a Quantifiably-Assured Microelectronics Pipeline. The prior year funding project codes did not continue after FY 2020 though the overarching goals of the program element are the same. The four new project codes refocus the PE and provide traceability to the current enhancement priorities of SOTA access, advanced heterogeneous integration and packaging, DoD unique needs, and quantifiable assurance throughout the microelectronics pipeline.

A. Mission Description and Budget Item Justification

This Program Element (PE) 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.

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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*

This PE supports the National Defense Strategy's (NDS) for 2018 line of effort to build a more lethal force through modernization of key capabilities, the NDS defense objective of establishing an unmatched twenty-first century National Security Innovation Base that effectively supports Department operations and sustains security and solvency, and the NDS strategic approach of reforming the Department's business practices by simultaneously increasing performance and affordability while still minimizing risk.

This PE 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; quantifiable 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 take into account 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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total
Previous President's Budget	489.251	509.195	0.000	0.000	0.000
Current President's Budget	489.251	704.091	647.226	0.000	647.226
Total Adjustments	0.000	194.896	647.226	0.000	647.226
• Congressional General Reductions	-	-			
• Congressional Directed Reductions	-	-			
• Congressional Rescissions	-	-			
• Congressional Adds	-	196.500			
• Congressional Directed Transfers	-	-			
• Reprogrammings	-	-			
• SBIR/STTR Transfer	-	-			
• FFRDC	-	-1.604	-25.430	-	-25.430
• Adjustments to Budget Year	-	-	324.569	-	324.569
• Economic Assumption	-	-	10.937	-	10.937
• Microelectronics Ecosystem	-	-	329.150	-	329.150
• Defense Microelectronics Cross-Functional Team Funding	-	-	8.000	-	8.000

Exhibit R-2, RDT&E Budget Item Justification: PB 2023 Office of the Secretary Of Defense	Date: April 2022
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*

Congressional Add Details ($ in Millions, and Includes General Reductions)	FY 2021	FY 2022
Project: 907: *Access to State-of-the-Art (SOTA) Microelectronics - Development*		
Congressional Add: *Design Acceleration*	-	100.000
Congressional Add Subtotals for Project: 907	-	100.000
Project: 911: *Address DoD Unique Needs - Radiation Hardening and non-CMOS*		
Congressional Add: *GaN and GaAs RFIC technology*	10.000	25.000
Congressional Add: *Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics*	-	18.000
Congressional Add: *Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology*	-	43.500
Congressional Add Subtotals for Project: 911	10.000	86.500
Project: 912: *Create a Quantifiably Assured-Microelectronics Pipeline*		
Congressional Add: *Trusted Artificial Intelligence*	5.000	10.000
Congressional Add Subtotals for Project: 912	5.000	10.000
Congressional Add Totals for all Projects	15.000	196.500

Change Summary Explanation

A Congressional rescission of $14.451 million was enacted as part of the FY 2022 Appropriation reducing the available FY 2021 budget to $474.800 million.

FY 2022 Appropriation increased in the amount of $196.500 million for the following efforts:
o $18.000 million - radiation-hardened fully-depleted silicon-on insulator microelectronics
o $25.000 million - GaN and GaAs RFIC technology
o $43.500 million - advanced node radiation-hardened fully depleted silicon-on-insulator technology
o $10.000 million - trusted artificial intelligence
o $100.000 million - design acceleration

FY 2023 funding increase reflects the fact that the FY 2022 President’s Budget request did not include out-year funding.

The FY 2023 funding request was reduced by $25.430 million to account for the availability of prior year execution balances.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense										Date: April 2022		
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 2021**	**FY 2022**	**FY 2023 Base**	**FY 2023 OCO**	**FY 2023 Total**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**Cost To Complete**	**Total Cost**
907: *Access to State-of-the-Art (SOTA) Microelectronics - Development*	1,199.177	281.769	395.976	362.558	0.000	362.558	313.905	280.511	276.170	262.858	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 and hardware assurance(SwA and 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 SwA and HwA 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 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 software and hardware available 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 state-of-the-art (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 quantifiable standards.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
Title: Joint Federated Assurance Center (JFAC)	8.810	9.000	10.820

Description: This project's activities will enhance the use of hardware and software tools, techniques, and assurance methodology directly with programs and organizations, throughout DoD and the life cycle. JFAC provides a common forum in DoD for assurance best practices, training, community dialog on assurance, access to new technology, collaboration with other components of USG, and tools usable by programs for maintaining quantifiable assurance data.

FY 2022 Plans:

• 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 JFAC infrastructure 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 software vulnerability mitigations, standards and technical implementation guidance, 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.
•Refine implementation of FY2019 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 2023 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.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
• 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 FY2019 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 2022 to FY 2023 Increase/Decrease Statement:*** Changes reflect minor budget fluctuations.			
Title: Design ***Description:*** The enhancement will develop quantifiably assured design concepts in manufactured systems, access to advanced state-of-the-art technology through secure design centers, enabling a formal risk-based approach to protection techniques. Manufactured microelectronics will be tested to ensure that intellectual property (IP) protections meet or exceed current National Security Agency standards for IP protection, and to demonstrate DoD's ability to detect certain malicious supply chain attacks on DoD microelectronics. Successful implementation will continue to transition these technologies to use in DoD programs and maintain access to multiple (2) commercial microelectronics facilities, and solidify a data-driven approach to supply chain protection. ***FY 2022 Plans:*** These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below. ***FY 2023 Plans:*** These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** These efforts are being merged into a combined program for both secure design and quantifiable assurance activities beginning with FY 2022. See "Secure Design and Quantifiable Assurance Development" program below.	42.800	0.000	0.000
Title: Foundry ***Description:*** This activity will implement multiple foundries process design kit (PDK) environments ensuring the government is not dependent on one single source for critical components and enable regular dedicated and multi-project wafer runs with fabrication data products.	44.338	45.000	20.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
Commercial foundries generate enormous amounts of data on their processes as a best practice for quality assurance to improve reliability and increase yield. It will collect and utilize this data to generate and allow quantitative comparison of performance and security metrics in the design and test stage of the microelectronics life cycle, thereby mitigating risk. ***FY 2022 Plans:*** Planned activities are as follows: • Enhance access to SOTA fabrication ecosystem. • Develop program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. ***FY 2023 Plans:*** Planned activities are as follows: • Continue to enhance access to SOTA fabrication ecosystem. • Maintain program of record access to assured fabrication flow and fund multi-project wafer production runs at multiple SOTA domestic sources. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Changes reflect a realignment of a portion of this foundry program to the “Secure Design and Quantifiable Assurance Development” program below and a re-balancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 902: “Access to State-of-the-Art (SOTA) Microelectronics – Demonstration.”			
Title: Secure Design and Quantifiable Assurance Development	185.821	241.976	143.738
Description: This activity includes verifying the ability to fabricate classified and/or export-controlled designs in on-shore commercial foundries and quantify integrity of designs and end products to include authentication and identification. Funding will establish multiple strategic partnerships with existing commercial domestic microelectronics design vendors and foundries to develop a data-driven,Description: This activity includes verifying the ability to fabricate classified and/or export-controlled designs in on-shore commercial foundries and quantify integrity of designs and end products to include authentication and identification. 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. The project will continue to develop the technical means for protecting intellectual property (IP) and obfuscating the final user function from the supply chain. This result 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			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
Regulations and Export Administration Regulations policy in this area. Funding will support activities to enhance the export control regime so that it maintains or strengthens current protections while enabling access to commercial capabilities, products, and IP. ***FY 2022 Plans:*** Planned activities are as follows: • Continue to enhance secure design and cloud capability with new tools/techniques. • 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. • Quantify transition of designs to prototypes and programs of record and maintain persistence in lifecycle assurance data and intellectual property. • Instantiate authentication and protection workflows for design assurance. • 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. • Conduct enhanced IP analysis; data driven risk assessments utilizing independent verification and validation, data captures, intelligence reports, probability of detection and false alarm rates, and game theoretic; and authentication and protection workflows. • Align program to provide persistent expertise delivery for application specific risk; compare design features to enhance verification and validation. • Develop a scalable classification system for design and verification ecosystem. • Analyze quantitative assurance data from pilot risk assessment demonstration. • In collaboration with industry standard bodies (Society of Automotive Engineers 32), promulgate new hardware assurance policy, best practices, and guidance via a navigable public library portal. ***FY 2023 Plans:*** Planned activities are as follows: • 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:***			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
Changes reflect a realignment of a portion of this foundry program to the "Secure Design and Quantifiable Assurance Development" program below and a re-balancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 902: "Access to State-of-the-Art (SOTA) Microelectronics – Demonstration."			
Title: Microelectronics Ecosystem	-	-	188.000
Description: This enhancement enables DoD and the defense industrial base to collaborate with the commercial microelectronics industry to increase proto-type development and address the war fighter's need to maintain and modernize weapon systems as the threat landscape shifts. It enables the use of combined cyber-security methods/cryptography in DoD hardware and utilization of complex computational capabilities in active electronically scanned array (AESA) phase array radar, electronic warfare (EW), and in secure communications, including 5G radio access network (RAN) systems. The department's future deployment of large constellations of networked satellites requires the use of leading-edge semiconductor components to enable real time communication and computation as well as for other advanced DoD system microelectronics applications. In addition, space based and strategic weapon systems require more advanced radiation hardened microelectronics. Virtually all DoD next-generation technology transition programs demand assured access to advanced microelectronics technology and components. This modernization enhancement ensures the full realization of the T&AM program investments already made. ***FY 2023 Plans:*** Develop a leading edge (<7nm), commercially-viable, U.S.-located domestic wafer foundry ecosystem access capability on the order of of > 26,000 wafer starts per month for design and manufacturing of quantifiably assured, dual-use commercial and DoD custom integrated circuits. A successful WILL enable the following: • Access to a SOTA U.S. wafer foundry. • Access to commercial and critical quantifiably assured dual-use COTS integrated circuits. • Access to capabilities necessary to develop quantifiably 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This enhancement enables T&AM program to demonstrate, by FY 2023-2025, full access to U.S. commercial SOTA design, foundry, and advanced packaging capability and meet DoD's unique needs within two to three years for modernization, including for 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 quantifiable 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			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
the requirements of the FY 2020 National Defense Autorotation Act Section 224 for the DoD to implement commercial standards for the acquisition of assured microelectronics products by 2023.			
Accomplishments/Planned Programs Subtotals	281.769	295.976	362.558

	FY 2021	FY 2022
Congressional Add: Design Acceleration	-	100.000
FY 2022 Plans: Accelerate DoD access to a microelectronics quantifiable assured (MQA) design and manufacturing ecosystem leveraging commercial capabilities for long-term sustainability. The following activities could be included: • Development and insertion of IP for ASIC and Chiplet security including authentication, Firmware Attestation and Decryption and SOC Interface encryption. • Development and insertion of tools and techniques for Protect of silicon IP during manufacturing and test phase, including multi-chip package (MCP) with full lifecycle MQA demonstration and maturation. • Demonstration of using COTS parts in more critical DoD applications utilizing MQA ant the inherent personalization features of the COTS device. • Accelerate MQA for DoD utilizing pilot programs for maturation of process, procedures and required technical capabilities for threat mitigation. This includes development of next generation ideas to increase the effectiveness of mitigations implemented in future updates to the LoA-1, LoA-2, or LoA-3 MQA standards. • Optical Tile prototype development and demonstration for addressing very high data rate using optical transmission.		
Congressional Adds Subtotals	-	100.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 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	1,199.177	281.769	Mar 2021	395.976	Mar 2022	362.558	Mar 2023	-		362.558	Continuing	Continuing	-
		Subtotal	1,199.177	281.769		395.976		362.558		-		362.558	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	1,199.177	281.769		395.976		362.558		-		362.558	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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*

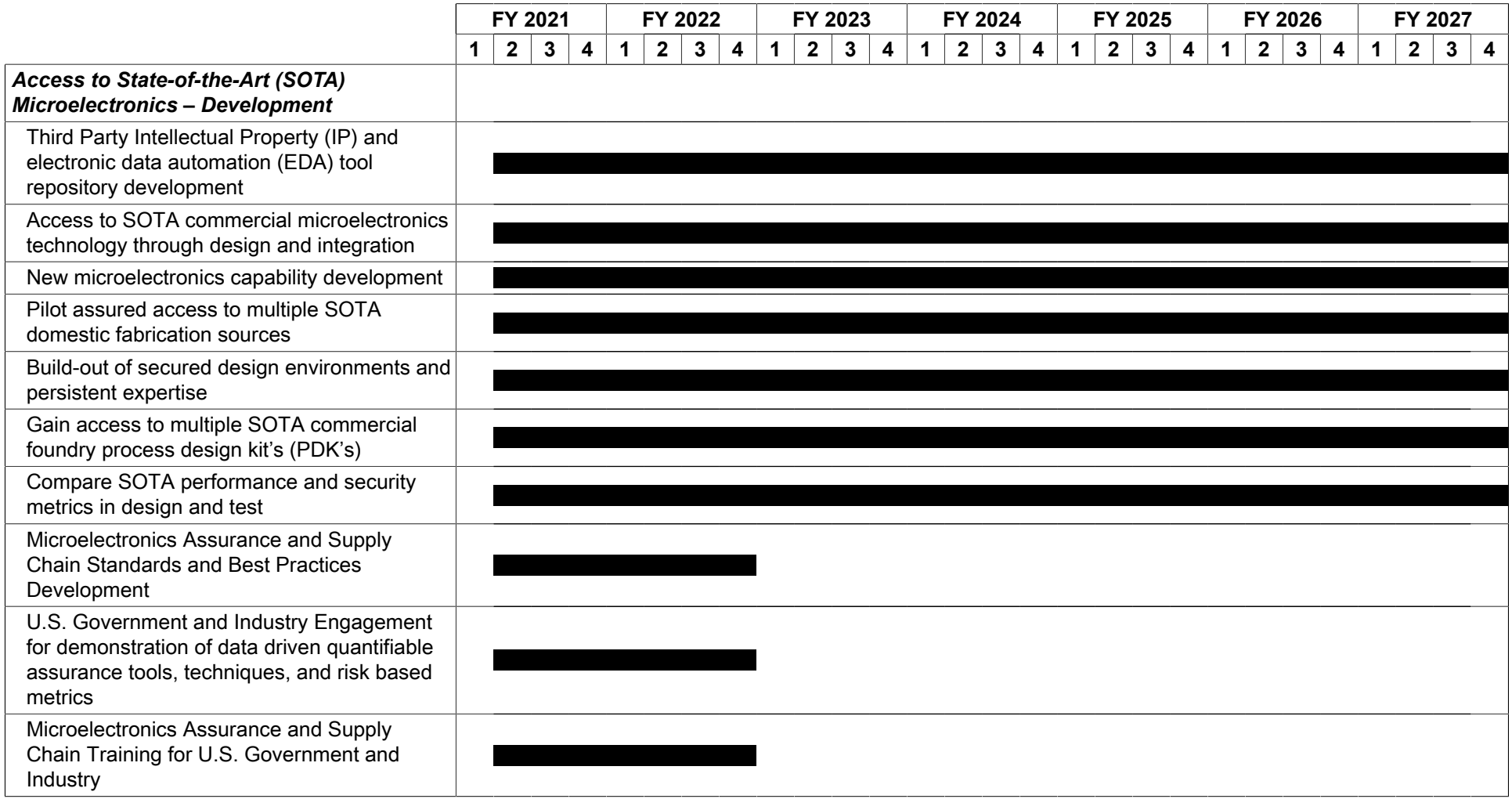

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - Development*

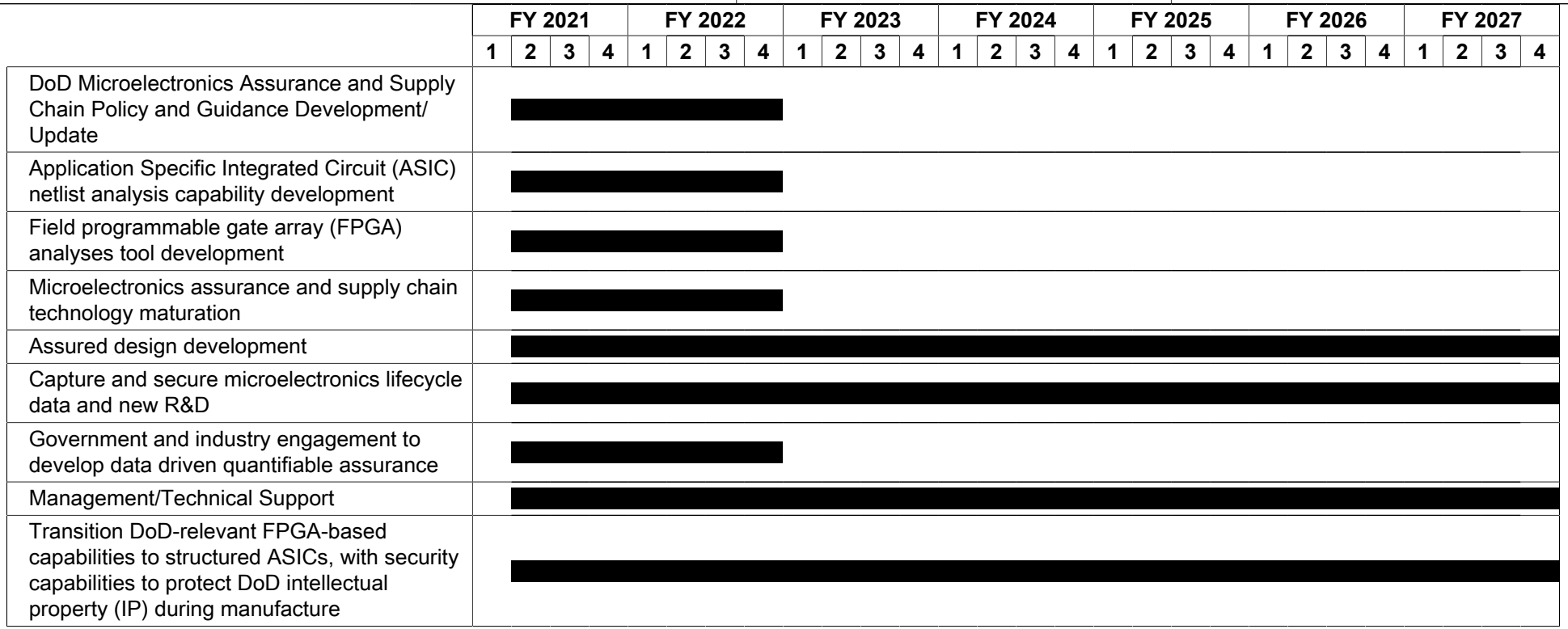

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 907 / *Access to State-of-the-Art (SOTA) Microelectronics - 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	2027
Access to SOTA commercial microelectronics technology through design and integration	2	2021	4	2027
New microelectronics capability development	2	2021	4	2027
Pilot assured access to multiple SOTA domestic fabrication sources	2	2021	4	2027
Build-out of secured design environments and persistent expertise	2	2021	4	2027
Gain access to multiple SOTA commercial foundry process design kit’s (PDK’s)	2	2021	4	2027
Compare SOTA performance and security metrics in design and test	2	2021	4	2027
Microelectronics Assurance and Supply Chain Standards and Best Practices Development	2	2021	4	2022
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics	2	2021	4	2022
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry	2	2021	4	2022
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update	2	2021	4	2022
Application Specific Integrated Circuit (ASIC) netlist analysis capability development	2	2021	4	2022
Field programmable gate array (FPGA) analyses tool development	2	2021	4	2022
Microelectronics assurance and supply chain technology maturation	2	2021	4	2022
Assured design development	2	2021	4	2027
Capture and secure microelectronics lifecycle data and new R&D	2	2021	4	2027
Government and industry engagement to develop data driven quantifiable assurance	2	2021	4	2022

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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	2027
Transition DoD-relevant FPGA-based capabilities to structured ASICs, with security capabilities to protect DoD intellectual property (IP) during manufacture	2	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
908: *Access to Advanced Packaging and Testing - Development*	0.000	81.438	112.343	56.118	0.000	56.118	0.000	0.000	0.000	0.000	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 2021	FY 2022	FY 2023
Title: Access to Advanced Packaging and Testing - Development	81.438	112.343	27.118

Description: This project will utilize specialized DoD chiplets (small specialized die) in a heterogeneous integrated (HI) assembly, allowing the DoD to accelerate adoption of the most advanced microelectronics available. 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 SHIP, assembly, and test capability. It will provide access to, 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 2022 Plans:

Planned activities are as follows:

• Enhance secure design and packaging capability with new tools/techniques.

• Continued development of secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability.

• Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications.

FY 2023 Plans:

Planned activities are as follows:

• Enhance secure design and packaging capability with new tools/techniques.

• Continued development of secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability.

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
• Maintain and continue to develop the SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Funding is decreased in order to begin following the establishment of the initial advanced packaging and testing capability, which will continue to deliver proto-type designs and hardware for accelerating program adoption and for qualification, and establish further develop the infrastructure and process that supports ITAR/EAR, proprietary and security requirements.			
Title: Microelectronics Ecosystem ***Description:*** Leading-edge semiconductor design and manufacturing technology forms the basis for many of the DoD modernization priorities. This program enhancement enables secure DoD access to leading-edge semiconductor technology through domestic U.S.-located sources of custom and dual-use leading edge integrated circuits utilizing heterogeneous integration and advanced packaging. This will enable implementation of complex, computation intensive AI algorithms for DoD AI and Autonomy applications. It will also facilitate use of integrated cyber-security methods/cryptography in DoD hardware and utilization of the complex computational capability required for Active Electronically Scanned Array (AESA) Phase Array Radar System and Electronic Warfare (EW) and communications including 5G Radio access network (RAN) systems. The proposed large constellations of networked satellites will also require leading-edge semiconductor components to enable real time communication and on-satellite computation. ***FY 2023 Plans:*** Establishment of a SOTA packaging and test facility capable of packaging, testing and personalization of integrated circuits in which the fully assembled and operationally functional MCP can contain ITAR regulated and/or classified information. Expand and accelerate development: • Implementation of post-assembly personalization and operational test capabilities. • Implement MPC finish capability for additional security to protect DoD specific IP and CPI in the fully functional MCP. • Accelerate access. • Enable re-shoring mature manufacturing, assembly, and test from commercial product lines such as high-volume flip-chip capabilities. • Enable access to advanced RF packages by providing a full suite of design tools, advanced packaging platforms, and a wide selection of material choices. • Accelerate DIB and DoD maturation leveraging commercial design using developed PDKs and ADKs to design custom devices. • Accelerate DoD access to SOTA MCP products utilizing commercial packaging, assembly, and test. • Create a catalog of designs, die, chiplets, package types, etc. • Ensure Reuse and Standardization for sustainability and costs.	-	-	29.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021	FY 2022	FY 2023
• Accelerate and expand adoption & Use in military systems to design, packaging, and assembly as a service. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Access to quantifiably assured dual-use COTS integrated circuits that are fabricated, assembled, tested and personalized in U.S.-located manufacturing facilities. Most dual-use COTS parts used for modernization priorities are currently manufactured in Asian facilities that do not provide measurable assurance. This situation is very unlikely to change without this enhancement.			
Accomplishments/Planned Programs Subtotals	81.438	112.343	56.118

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 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	-	81.438	Mar 2021	112.343	Mar 2022	56.118	Mar 2023	-		56.118	Continuing	Continuing	-
		Subtotal	-	81.438		112.343		56.118		-		56.118	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	81.438		112.343		56.118		-		56.118	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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
Access to Advanced Packaging and Testing - Development																												
Develop specialized DoD chiplets in a heterogeneous integrated (HI) assembly																												
Qualify and adopt advanced microelectronics packaging and test capabilities																												
Engage with world-class industrial partners to gain access to proprietary packaging technologies																												
Enhance secure design and packaging capability with new tools/techniques																												
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability																												
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications																												
Reduce DoD program packaging size, weight, and power requirements																												
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies																												
Management/Technical Support																												

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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*

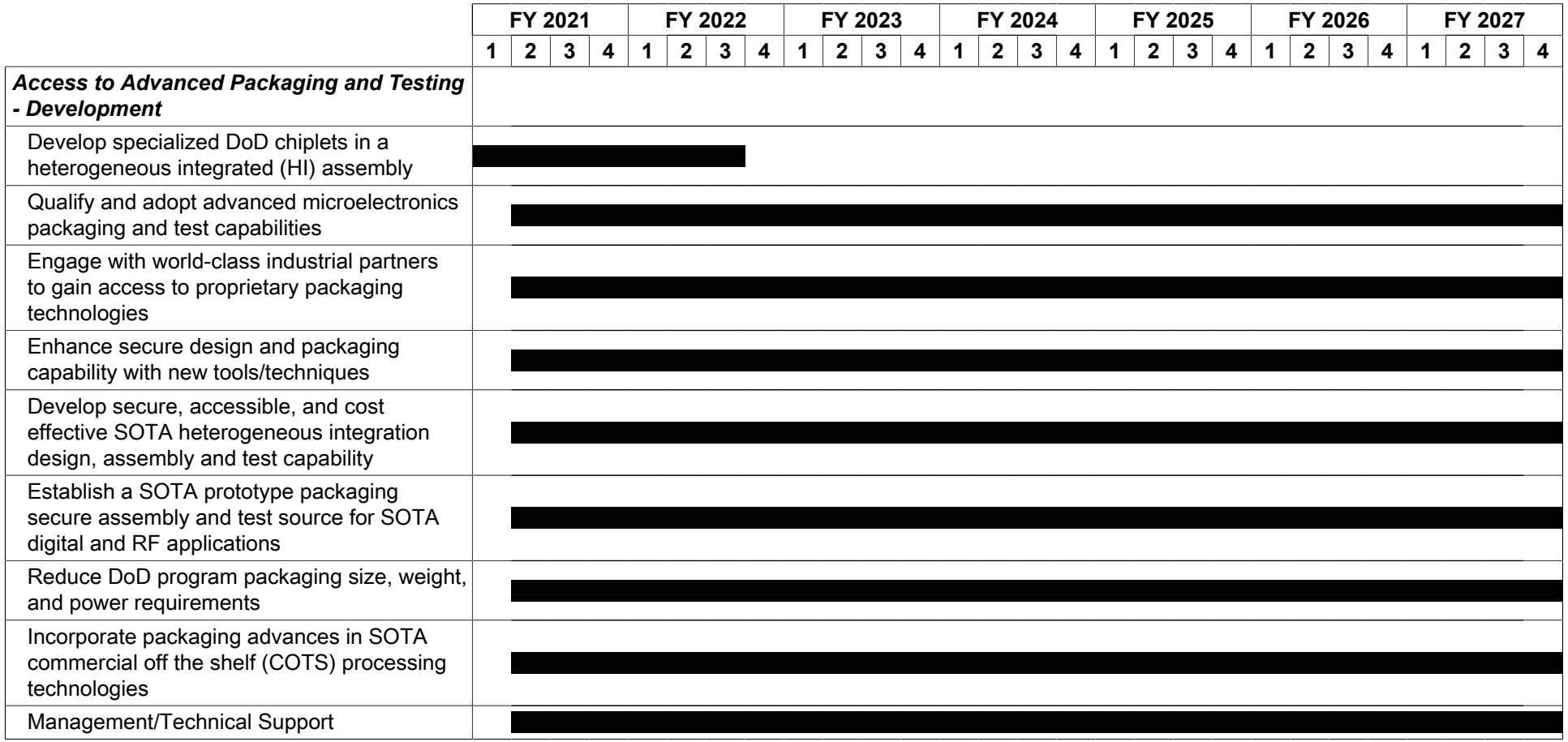

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 908 / *Access to Advanced Packaging and Testing - 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	2022
Qualify and adopt advanced microelectronics packaging and test capabilities	2	2021	4	2027
Engage with world-class industrial partners to gain access to proprietary packaging technologies	2	2021	4	2027
Enhance secure design and packaging capability with new tools/techniques	2	2021	4	2027
Develop secure, accessible, and cost effective SOTA heterogeneous integration design, assembly and test capability	2	2021	4	2027
Establish a SOTA prototype packaging secure assembly and test source for SOTA digital and RF applications	2	2021	4	2027
Reduce DoD program packaging size, weight, and power requirements	2	2021	4	2027
Incorporate packaging advances in SOTA commercial off the shelf (COTS) processing technologies	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
911: *Address DoD Unique Needs - Radiation Hardening and non-CMOS*	0.000	50.500	169.072	107.003	0.000	107.003	154.852	136.718	134.642	128.150	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 to have DoD reliability access to subject matter expertise, technology, and manufacturing.

In addition to Rad Hard 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 provide overmatch technology to the warfighter. At the same time, the DoD must fill the gaps which are left unaddressed 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 tailor early process development towards unique DoD interests 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 2021	FY 2022	FY 2023
Title: Address DoD Unique Needs Especially - Radiation Hardening and non-CMOS - Development	40.500	82.572	52.603
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			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
programs with radiation hardened requirements. A similar situation exists for radio frequency and optical applications. These two applications reflect only a small market with unique costs and specifications, which does not inherently create incentive for industrial investment Within RF and opto-electronics, investments will be made in RF GaN and integrated photonic material sources, foundries, and packaging facilities in order to enable low-size, weight, and power devices which broadly access the millimeter wave spectrum, while providing high-bandwidth data transmission. ***FY 2022 Plans:*** Planned activities are as follows: • Continue development of RHBD techniques in SOTA technologies with validated PDKs • Transition developed RH technologies into space and strategic programs. • Qualify large-diameter Nitrogen-Polar RF GaN material source and mature off-axis Silicon Carbide substrate. • Baseline at MRL-4 and mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services. • Perform an industrial base assessment of the integrated photonics foundry ecosystem and generate actionable guidance for foundry maturation by the DoD. • Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. ***FY 2023 Plans:*** Planned activities are as follows: • Continue development of RHBD techniques in SOTA technologies with validated PDKs • Transition developed RH technologies into space and strategic programs. • Continue to mature large-diameter Nitrogen-Polar RF GaN material source and off-axis Silicon Carbide substrate. Foundries will assess epiwafers and provide feedback critical to baselining the N-Polar recipe. • Continue to mature towards MRL-6 multiple state-of-the-art RF GaN foundries offering open access to millimeter wave device design and advanced interconnect services. • Act upon industrial base assessment of the integrated photonics foundry ecosystem and mature strategic components of the domestic integrated photonics supply chain. • Demonstrate access to state-of-the-art RF GaN and integrated photonic foundries via advanced prototype demonstrators. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Changes reflect a rebalancing of funding between this project and PE 0605294D8Z, Trusted and Assured Microelectronics (Budget Activity 5), Project 905: “Address DoD Unique Needs - Radiation Hardening and non-CMOS - Demonstration.”			
Title: Microelectronics Ecosystem	-	-	54.400

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
Description: DoD requires access to Radiation Hardened (Rad Hard), radio frequency (RF), and opto-electronics (OE) that requires additional investment to accelerate and expand demonstrate product design techniques and material maturation in next generation SOTA technology nodes. ***FY 2023 Plans:*** • Establishes the first domestic production source of N-Polar GaN material, and demonstrates production of mmW devices with maximum RF power and efficiency. • 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. • Establishes 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Strategic and space radiation-hardened microelectronics, and are critical in support of ongoing and future nuclear modernization and sustainment programs. This funding eliminates gaps in research and development (R&D), domestic capability, memory technologies, and test and evaluation infrastructure to alleviate the significant nuclear modernization and sustainment program risks. Additionally, RF and opto-electronic investments accelerate secure access to state of the art RF GaN and silicon photonic materials, foundries, and packaging facilities, which enables next generation sensors and communications. State-of-the-art prototypes and IP demonstrate low-size, weight, and power millimeter wave access and high-bandwidth data transmission for DoD programs and the Defense Industrial Base.			
Accomplishments/Planned Programs Subtotals	40.500	82.572	107.003

	FY 2021	FY 2022
Congressional Add: GaN and GaAs RFIC technology	10.000	25.000
FY 2021 Accomplishments: FY 2021 Accomplishments: Initiated effort to mature SOTA RF GaN nodes towards production demonstrations and mature advanced interconnect for improved integration into advanced packaging. ***FY 2022 Plans:*** • Demonstrate production of SOTA RF GaN devices and advanced interconnect components in a production relevant environment. • Demonstrate millimeter wave device designs/IP via open access to SOTA RF GaN nodes.		
Congressional Add: Radiation-Hardened Fully-Depleted Silicon-on-Insulator Microelectronics	-	18.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

	FY 2021	FY 2022
FY 2022 Plans: 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.		
Congressional Add: Advanced Node Radiation-Hardened Fully-Depleted Silicon-on-Insulator Technology	-	43.500
FY 2022 Plans: 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.		
Congressional Adds Subtotals	10.000	86.500

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 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	-	50.500	Mar 2021	169.072	Mar 2022	107.003	Mar 2023	-		107.003	Continuing	Continuing	-
		Subtotal	-	50.500		169.072		107.003		-		107.003	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	50.500		169.072		107.003		-		107.003	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

	FY 2014				FY 2015				FY 2016				FY 2017				FY 2018				FY 2019				FY 2020			
	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
Address DoD Unique Needs - Development																												
Radiation Training in Support of Radiation Hardened by Design (RHBD) and Radiation Hardened by Process (RHBP) Initiatives																												
Strategic Radiation Hardened Electronics council (SRHEC) Coordination																												
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices																												
Radiation hardening by process and radiation hardening by design development activities																												
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																												
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source																												
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics																												
Access, mature, and assure state-of-the-art foundry and packaging processes for monolithic microwave integrated circuits (MMICs) and photonic integrated circuits (PICs)																												
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem																												

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

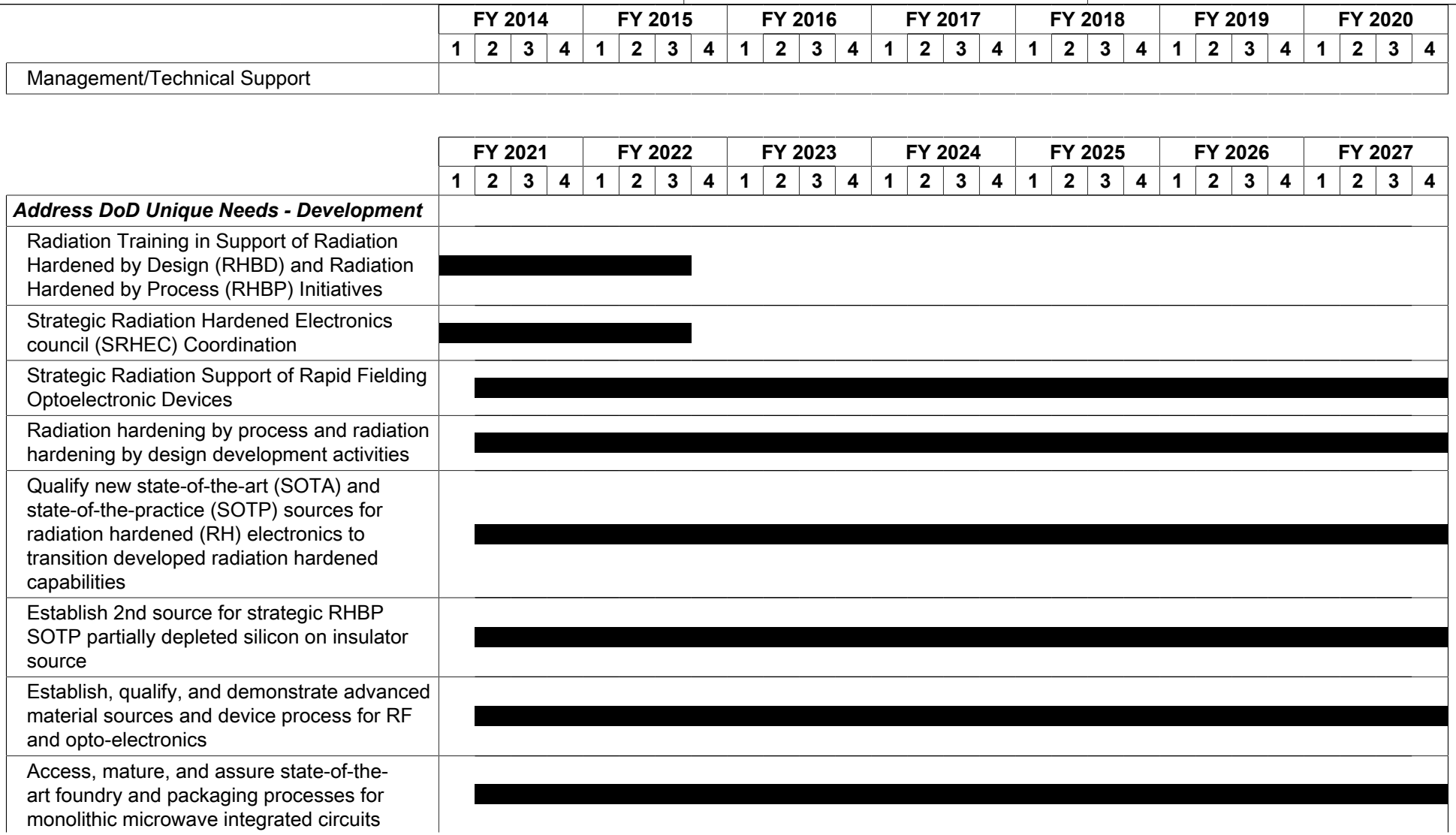

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

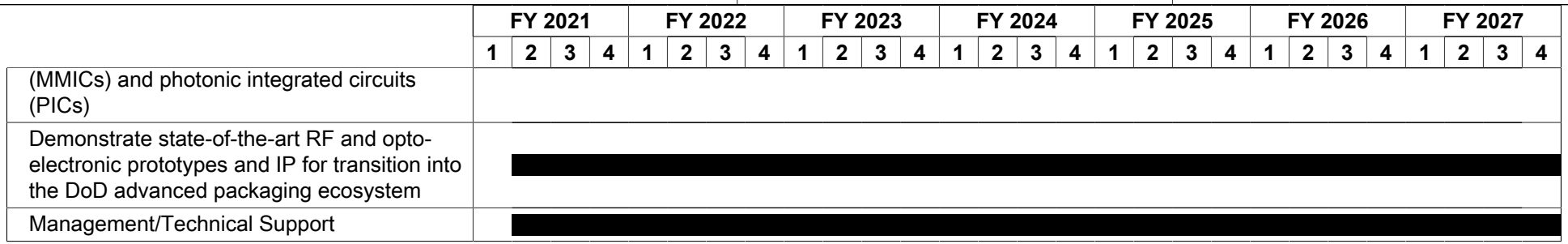

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 911 / *Address DoD Unique Needs - Radiation Hardening and non-CMOS*

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	3	2022
Strategic Radiation Hardened Electronics council (SRHEC) Coordination	4	2020	3	2022
Strategic Radiation Support of Rapid Fielding Optoelectronic Devices	2	2021	4	2027
Radiation hardening by process and radiation hardening by design development activities	2	2021	4	2027
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	2027
Establish 2nd source for strategic RHBP SOTP partially depleted silicon on insulator source	2	2021	4	2027
Establish, qualify, and demonstrate advanced material sources and device process for RF and opto-electronics	2	2021	4	2027
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	2027
Demonstrate state-of-the-art RF and opto-electronic prototypes and IP for transition into the DoD advanced packaging ecosystem	2	2021	4	2027
Management/Technical Support	2	2021	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
Appropriation/Budget Activity 0400 / 4	R-1 Program Element (Number/Name) PE 0604294D8Z / *Trusted and Assured Microelectronics*	Project (Number/Name) 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*	

COST ($ in Millions)	Prior Years	FY 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
912: *Create a Quantifiably Assured-Microelectronics Pipeline*	0.000	75.544	26.700	113.547	0.000	113.547	189.525	167.149	164.507	156.573	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

A. Mission Description and Budget Item Justification

This project will promote microelectronics innovation and create a quantifiably-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, ensure DoD has access to the next generation of advanced technology with quantifiable assurance 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 quantifiable assurance paradigm for supply chain protection. It will strengthen security while improving access, exposing no sensitive intellectual property (IP) to the foundry and requiring post-manufacture validation of foundry products. The enhancement will develop quantifiably 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 2021	FY 2022	FY 2023
Title: Create a Quantifiably-Assured Microelectronics Pipeline – Development	70.544	16.700	55.797
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 SOTA technology providers.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
FY 2022 Plans: • Development of DoD program relevant application prototypes. • Foster education and workforce development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners. • Execute radiation hardened, heterogeneous integration/advanced packaging, and System On A Chip design Public-Private-Academic Partnership (PPAP) Models. Develop Supply Chain PPAP model. Expand PPAP partners and collaborators. • 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. ***FY 2023 Plans:*** • Development of DoD program relevant application prototypes. • Foster education and workforce development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners. • Execute radiation hardened, heterogeneous integration/advanced packaging, and System On A Chip design Public-Private-Academic Partnership (PPAP) Models. Develop Supply Chain PPAP model. Expand PPAP partners and collaborators. • 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. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Changes reflect the realignment of quantifiable assurance activities to this Project code from Project code 907 beginning in FY 2023.			
Title: Microelectronics Ecosystem	-	-	57.750
Description: 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. ME Assurance Framework addresses FY20 NDAA Sect 224 requirement for trusted supply chain and operational security standards. ***FY 2023 Plans:*** • Enable and accelerate maturation and adoption of Microelectronics (ME) Assurance Framework. • Mature a regulatory and policy framework to enable long-term access to assured legacy and SOTA microelectronics. o Extend access. o Evaluate, mature, and improve assurance practices. • Ensure approach is aligned as part of DoD's comprehensive systems security engineering (SSE) framework.			

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

B. Accomplishments/Planned Programs ($ in Millions)	FY 2021	FY 2022	FY 2023
o Trusted Systems and Networks (TSN) Analysis. o Component level – FY20 NDAA Section 224 response for custom and commercial microelectronics. • Use pilot projects to mature threat driven risk-based decision making models. • Leverages existing efforts. o DoD policy, guidance, threat identification efforts, analysis and response, mitigations, technical efforts. o Commercial standards and best practices. o Proactive Technology Analysis. • Supports breadth of DoD microelectronics. o Custom – Custom Integrated Circuit (CIC) and Field Programmable Gate Array (FPGA). o Commercial – Commercial Off The Shelf (COTS) and modified commercial components. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** Accelerate the adoption of ME Assurance Framework utilizing microelectronics quantifiable assurance 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.			
Accomplishments/Planned Programs Subtotals	70.544	16.700	113.547

	FY 2021	FY 2022
Congressional Add: Trusted Artificial Intelligence	5.000	10.000
FY 2021 Accomplishments: Develop the Trusted AI Consortium and Public-Private-Academic Partnership (PPAP) Model through five Graduate Research Projects across three Universities.		
FY 2022 Plans: The overall goal of the public-private-academic partnership (PPAP) model is to develop the workforce around Embedded Systems Security/Artificial Intelligence (ESS/AI) and its intersection with Microelectronics, Embedded Systems, and Cybersecurity by training students in the emerging area of Trusted AI. Students will be trained through research projects that will address difficult problems in AI related to trust, verifiability, risk modeling, bias, fairness, human interaction, and feedback. Human-machine Pairing for Trustworthy AI. Develop a framework to evaluate the feedback loops between human operators and Artificial Intelligence / Machine Learning (AI/ML) systems that affect decision-making and final behavior.		

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

	FY 2021	FY 2022
Statistical Analysis and Measurement of Neural Networks. Facilitate the development of techniques essential to the goals of the Trusted AI project and train students in the best practices that embody these techniques, ultimately providing a knowledgeable workforce for the defense ecosystem. AI Career-Cyber Coaching for US Workers: (1) AI Development of career cyber coaching algorithms and job maps that enable users to explore job risks and possible career paths in alignment with self-reported interests and preferences along with auto-assessed skills, with a special focus on microelectronics and the specialty areas of SCALE (including but not limited to radiation hardened technologies, heterogeneous integration/ advanced packaging, supply chain awareness, embedded systems security / artificial intelligence, and system on chip); and (2) Scale-up of training of coaches to prepare them to use the algorithm as part of career counseling services so they can guide workers with maximum effect, even and especially in times of increased demand, whether in response to regional and national labor market trends, plant closures, or a pandemic.		
Congressional Adds Subtotals	5.000	10.000

C. Other Program Funding Summary ($ in Millions)

N/A

Remarks

D. Acquisition Strategy

N/A

Exhibit R-3, RDT&E Project Cost Analysis: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

Product Development ($ in Millions)

Cost Category Item	Contract Method & Type	Performing Activity & Location	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Create a Resilient and Robust Microelectronics Pipeline	MIPR	Defense Advanced Research Projects Agency, Air Force, Army, Navy, National Security Agency : Various	-	75.544	Mar 2021	26.700	Mar 2022	113.547	Mar 2023	-		113.547	Continuing	Continuing	-
		Subtotal	-	75.544		26.700		113.547		-		113.547	Continuing	Continuing	N/A

	Prior Years	FY 2021		FY 2022		FY 2023 Base		FY 2023 OCO		FY 2023 Total	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	75.544		26.700		113.547		-		113.547	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

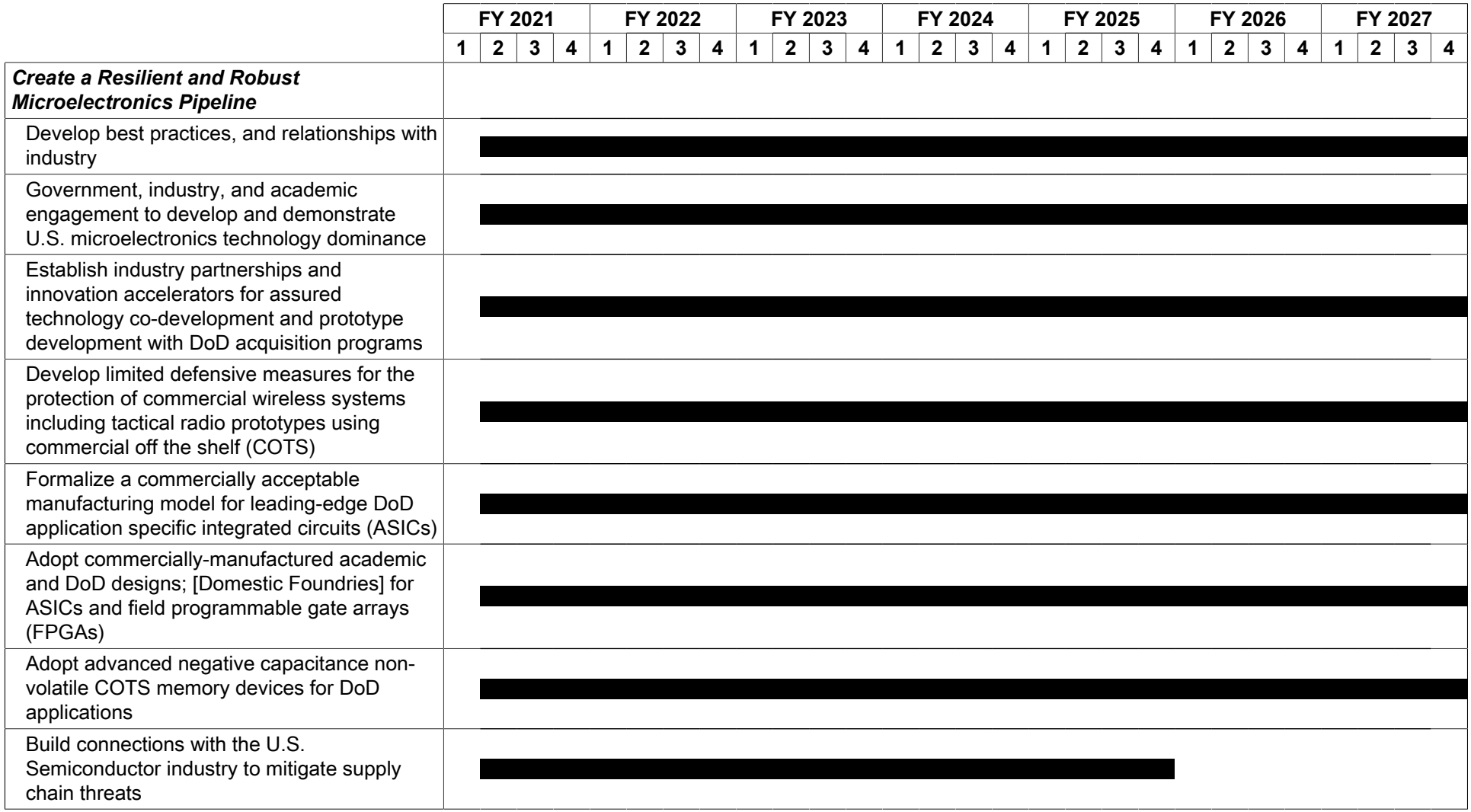

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

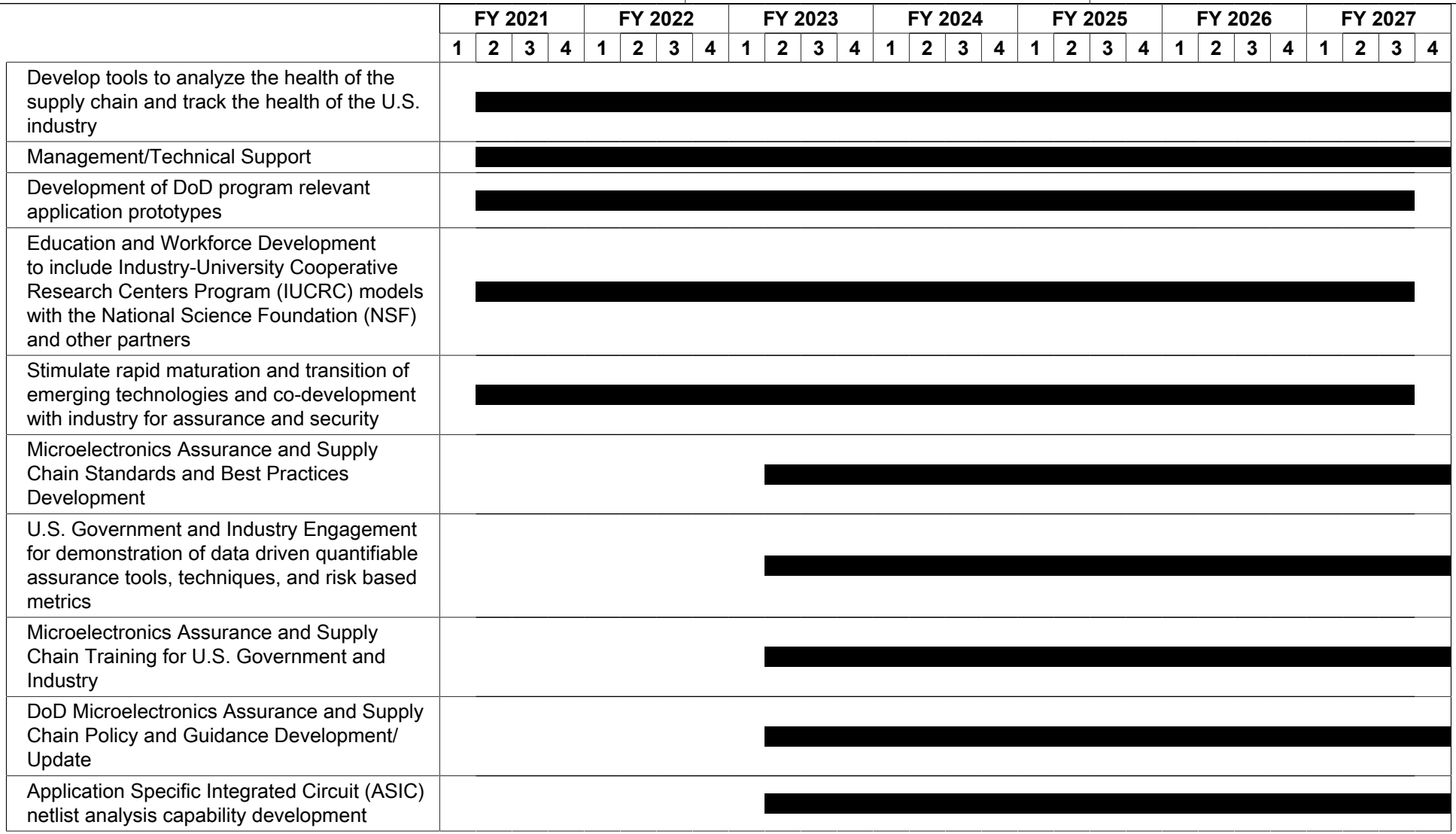

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics Pipeline*

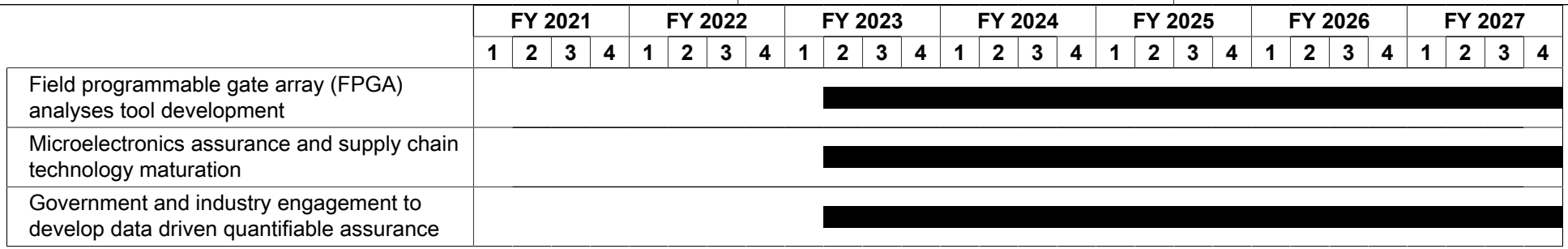

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably Assured-Microelectronics 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	2027
Government, industry, and academic engagement to develop and demonstrate U.S. microelectronics technology dominance	2	2021	4	2027
Establish industry partnerships and innovation accelerators for assured technology co-development and prototype development with DoD acquisition programs	2	2021	4	2027
Develop limited defensive measures for the protection of commercial wireless systems including tactical radio prototypes using commercial off the shelf (COTS)	2	2021	4	2027
Formalize a commercially acceptable manufacturing model for leading-edge DoD application specific integrated circuits (ASICs)	2	2021	4	2027
Adopt commercially-manufactured academic and DoD designs; [Domestic Foundries] for ASICs and field programmable gate arrays (FPGAs)	2	2021	4	2027
Adopt advanced negative capacitance non-volatile COTS memory devices for DoD applications	2	2021	4	2027
Build connections with the U.S. Semiconductor industry to mitigate supply chain threats	2	2021	4	2025
Develop tools to analyze the health of the supply chain and track the health of the U.S. industry	2	2021	4	2027
Management/Technical Support	2	2021	4	2027
Development of DoD program relevant application prototypes	2	2021	3	2027
Education and Workforce Development to include Industry-University Cooperative Research Centers Program (IUCRC) models with the National Science Foundation (NSF) and other partners	2	2021	3	2027
Stimulate rapid maturation and transition of emerging technologies and co-development with industry for assurance and security	2	2021	3	2027

Exhibit R-4A, RDT&E Schedule Details: PB 2023 Office of the Secretary Of Defense		Date: April 2022
Appropriation/Budget Activity 0400 / 4	**R-1 Program Element (Number/Name)** PE 0604294D8Z / *Trusted and Assured Microelectronics*	**Project (Number/Name)** 912 / *Create a Quantifiably 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	2027
U.S. Government and Industry Engagement for demonstration of data driven quantifiable assurance tools, techniques, and risk based metrics	2	2023	4	2027
Microelectronics Assurance and Supply Chain Training for U.S. Government and Industry	2	2023	4	2027
DoD Microelectronics Assurance and Supply Chain Policy and Guidance Development/Update	2	2023	4	2027
Application Specific Integrated Circuit (ASIC) netlist analysis capability development	2	2023	4	2027
Field programmable gate array (FPGA) analyses tool development	2	2023	4	2027
Microelectronics assurance and supply chain technology maturation	2	2023	4	2027
Government and industry engagement to develop data driven quantifiable assurance	2	2023	4	2027

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense			Date: April 2022
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 2021	FY 2022	FY 2023 Base	FY 2023 OCO	FY 2023 Total	FY 2024	FY 2025	FY 2026	FY 2027	Cost To Complete	Total Cost
913: *Defense Microelectronics Cross-Functional Team Funding*	-	0.000	0.000	8.000	-	8.000	4.000	0.000	0.000	0.000	Continuing	Continuing
Quantity of RDT&E Articles	-	-	-	-	-	-	-	-	-	-		

Note

This is not a new start Project Code in FY 2023. Funding was transferred from Program Element 0607210D8Z Project Code 821, due to a DSD-directed realignment within DoD to support the success of the Cross-Functional Team.

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. In order 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 2021	FY 2022	FY 2023
Title: Defense Microelectronics Cross-Functional Team Funding	-	-	8.000
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 2023 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. The CFT will complete the development of the initial DoD strategy, and develop recommendations on roadmaps to execute that include the funding, policy, and legislation to ensure the strategy can be successfully executed. ***FY 2022 to FY 2023 Increase/Decrease Statement:*** This is not a new start Project Code in FY 2023. Funding was transferred from Program Element 0607210D8Z Project Code 821, due to a DSD-directed realignment within DoD to support the success of the Cross-Functional Team.			
Accomplishments/Planned Programs Subtotals	-	-	8.000

Exhibit R-2A, RDT&E Project Justification: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Defense Microelectronics Cross-Functional Team Funding	MIPR	TBD : TBD	-	-		-		8.000	Apr 2023	-		8.000	Continuing	Continuing	-
		Subtotal	-	-		-		8.000		-		8.000	Continuing	Continuing	N/A

	Prior Years	FY 2021 Cost	FY 2021 Award Date	FY 2022 Cost	FY 2022 Award Date	FY 2023 Base Cost	FY 2023 Base Award Date	FY 2023 OCO Cost	FY 2023 OCO Award Date	FY 2023 Total Cost	Cost To Complete	Total Cost	Target Value of Contract
Project Cost Totals	-	-		-		8.000		-		8.000	Continuing	Continuing	N/A

Remarks

Exhibit R-4, RDT&E Schedule Profile: PB 2023 Office of the Secretary Of Defense		Date: April 2022
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 2021				FY 2022				FY 2023				FY 2024				FY 2025				FY 2026				FY 2027			
	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 2023 Office of the Secretary Of Defense		Date: April 2022
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