Exhibit R-2, RDT&E Budget Item Justification							Date: February 2007	
Appropriation/Budget Activity RDT&E, Defense-wide BA #3				R-1 Item Nomenclature: Microelectronics Technology Development and Support Program Element: 0603720S				
Cost ($ in millions)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013
Total PE Cost	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000

A. Mission Description and Budget Item Justification: DMEA was established in 1997 by the Office of the Secretary of Defense to act as the joint DoD Center for microelectronics acquisition, transformation, and support. The DMEA mission is to design, develop, and demonstrate microelectronics concepts, advanced technologies, and applications to extend the life of weapon systems and to solve operational problems (e.g., reliability, maintainability, performance, and assured supply). This includes providing for the development and long-term support structure necessary to ensure rapid prototyping, insertion, and support of microelectronics technologies into fielded systems. The Defense Microelectronics Activity **(**DMEA) provides technical and application engineering support for the implementation of advanced microelectronics research technologies from design through assembly and installation. The DMEA provides an organic capability to support these strategically important technologies within the DoD. These advanced technologies are translated into solutions for military needs. The DoD is increasingly reliant on the use of "smart" weapons based on microelectronics. All future engagement scenarios depend on the use of these systems. Likewise, the use of microelectronics has exploded in the commercial world, driving the semiconductor industry to supersede successive generations of semiconductor technologies with new technologies every 18 months. The growth in commercial products has driven DoD's share of the semiconductor market below 0.1%. DoD must rely on technologies that become obsolete every 18 months and an industry in which DoD has no influence due to low market share. This is a Defense-wide issue since many systems across the Department use the same microelectronic process technologies. Therefore, the DMEA mission includes providing for the development and long-term support structure necessary to ensure rapid prototyping, insertion, and support of advanced microelectronics technologies into fielded systems. The DMEA applies both available leading-edge technologies and innovative applied research and development (R&D) approaches to develop solutions to current problems. DMEA's RDT&E program is comprised of a mix of studies, investigations, planning efforts, developments, fabrications, and the insertions of solutions. This effort applies to all DoD systems using electronics e.g., F-22, B-2, Airborne Warning And Control System, F-16, F-15, F-14, Global Positioning System, USQ-113, Joint Strike Fighter, EA-6B, M-65, AN/TSC-93B, and AN/GSC-49 (V). Funds are required for technical and analytical support, equipment, supplies, travel, and publications.

Exhibit R-2, RDT&E Budget Item Justification							Date: February 2007	
Appropriation/Budget Activity RDT&E, Defense-wide BA #3				R-1 Item Nomenclature: Microelectronics Technology Development and Support Program Element: 0603720S				
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Total PE Cost	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000

B. Program Change Summary: (Show total funding, schedule, and technical changes for the program element that have occurred since the previous President's Budget Submission)

	FY 06	FY 07	FY 08	FY 09
PB 07	0.000	0.000	0.000	0.000
Current BES	118.383	92.554	0.000	0.000
Total Adjustment	0.000	0.000	0.000	0.000
Congressional Program Reductions	0. 000	0.000	0.000	0.000
Congressional Rescissions	0. 000	0.000	0.000	0.000
Congressional Increases	115.037	46.723	0.000	0.000
Reprogramming	3.346	45.831	0.000	0.000

Change Summary Explanation:

FY06 - Congressionally directed programs in new PE0603720S, Microelectronics Technology Development and Support. Reprogramming from Software Engineering Institute to Microelectronics Technology Development and Support for Advanced Lithography project that was in the wrong PE for proper execution.

FY07 – Congressionally directed programs in new PE0603720S, Microelectronics Technology Development and Support.($45.598M) Request submitted to reprogram six lines ($44.688M) from PE0603712S, Generic Logistics R&D Technology Demonstrations to PE0603720S, Microelectronics Technology Development and Support that were in the wrong PE for proper execution.

C. Other Program Funding Summary: Provided at the Project Level.

D. Acquisition Strategy. N/A

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
Appropriation/Budget Activity RDT&E, Defense-wide BA #3				Microelectronics Technology Development and Support Program Element: 0603720S				
Cost ($ in millions)	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity - N/A								

A. Mission Description and Budget Item Justification: The Microelectronics Technology Development and Support efforts are to design, develop, and demonstrate microelectronics concepts, technologies, and applications to extend the life of weapon systems and to solve operational problems (e.g., reliability, maintainability, and performance) while addressing diminishing manufacturing sources. This includes providing for the development and long-term support structure necessary to ensure rapid prototyping, insertion, and support of microelectronics technologies into fielded systems. The Defense Microelectronics Activity **(**DMEA) provides technical and application engineering support for the implementation of advanced microelectronics research technologies from design through assembly and installation. The DMEA provides an organic capability to support these strategically important technologies within the DoD. These advanced technologies are translated into solutions for military needs. DMEA's RDT&E program is comprised of a mix of studies, investigations, planning efforts, developments, fabrications, and the insertions of solutions. This effort applies to all DoD systems using electronics e.g., F-22, B-2, Airborne Warning And Control System, F-16, F-15, F-14, Global Positioning System, USQ-113, Joint Strike Fighter, EA-6B, M-65, AN/TSC-93B, and AN/GSC-49 (V). Funds are required for technical and analytical support, equipment, supplies, travel, and publications.

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Ferrite Diminishing Manufacturing Program efforts will be the identification, assessment, and demonstration of advanced technologies to facilitate improved electronics and microwave subsystems for size, weight and power (SWaP) improvements in the electronics required to support the ferrite devices for future satellite and weapon system programs ($1.034)

- University Materials Characterization and Metrology Center efforts are to identify the chemical and structural elements of materials and devices, as well as chemical, optical, electrical, and physical principles in measurement science and to be an enabler to the nanotechnology industry by providing expertise, training, and making available shared diagnostics equipment. ($0.987)

- DMEA Core Research efforts are to design, develop, and demonstrate microelectronics concepts, technologies, and applications to extend the life of weapon systems and to solve operational problems (e.g., reliability, maintainability, and performance).and to ensure rapid insertion of transformational technologies into fielded weapon systems by providing the necessary development, manufacturing engineering, and long-term support structure. ($19.741)

- Spintronics Memory Storage Technology efforts are to achieve a breakthrough in magnetic random access memory (MRAM) technologies together with companion programs in electronics packaging and advanced materials in order to develop a technology that will be produced domestically and will transition from the lab to the battlefield in a timely and cost effective manner ($10.068)

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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Center for Nanoscience Innovation efforts are to systematically clarify the feasibility of applying nanoscience and technology to defense requirements. ($8.390)

- Ruggedized Smart/Secure Radio Frequency Identification (RFID) efforts are to develop rugged, adaptive and reconfigurable reader technology using intelligent sensing and signal processing, and to develop rugged single chip RFID transceivers integrated with anti-tamper and tripwire systems to enable the use of RFID to secure critical assets. Investigated the use of ultra-thin silicon on sapphire technology to improve power reflection from the RFID tag which will impact system performance in the areas of read efficiency and range. The RFID reader is being redesigned to incorporate ruggedization for military use and software be developed to include security features. ($5.034)

- Optimizing Electronics for Advanced Controlled Environment Systems (ACES) efforts are to resolve thermal issues regarding electronics densification & advanced electronics packaging in military high-performance computing applications by designing components, chip-scale packaging, stacked structures, and electronic environmental systems that can withstand the demanding military thermal environments. ($4.195)

- Low Voltage Tunable Material efforts are to develop doped Barium Strontium Titanate (BST) thin film material to create reliable 3 to 4 volt tunable components. These components will have the high tunability, high reliability and good RF power handling capability required in critical military and Homeland Security communications systems. One path forward for improving Low Voltage Tunable Materials is the marriage of bismuth zinc niobate (BZN) tunable material with BST. The tuning properties of BZN complement those of BST such that linearity and Q for thin film tunable materials are increased and stabilized. ($1.974)

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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Spray Cooling Migration Program efforts develop standardized spray cooling technology products, demonstrate them in cross-platform migrations and develop an automated process for integration of spray cooling products into military systems. ($5.034)

- Tunable Monolithic Integrated Circuit efforts are to monolithically integrate tunable radio frequency dielectric devices with high performance digital processing circuits, high voltage generation circuits and control electronics on a common substrate. Preliminary investigations indicate that tunable dielectric devices and RF CMOS on sapphire substrates are compatible while maintaining high levels of performance. Critical to success is the control cross contamination of the materials used in each process. ($1.974)

- Short Cycle Radio Frequency (RF) System on a Chip (RFSoC) Design efforts are to develop an approach to seamlessly integrate all RF and digital subsystem and chip-level design tools which could shorten design time by up to 90% and result in single-chip RFSoC. with parts count, assembly steps, size, and costs reduced by 50-90% as compared to existing RF solutions based on non-integrated discrete components. ($1.480)

- Development for Low Cost High Temp Superconductor (HTS) Receiver Manufacturing efforts are to develop and demonstrate the key low cost fabrication techniques to reduce the manufacturing cost of the HTS receiver dramatically, more than a factor of ten, which will enable very pure, linear, efficient, cost-effective wireless signal reception, not possible with any other technology. The Low Cost HST has met or exceeds several of the program goals. For example, the transition from magnesium oxide substrates to sapphire was successful. The issues of dissimilar material expansion were controlled and performance on sapphire is virtually the same as magnesium oxide. The manufacturing cost saving by moving to sapphire alone is 50% of the receiver unit cost. Other cost reductions were achieved in cryocooler redesign. ($2.517)

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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Advanced Power Management for Wireless Systems efforts are to demonstrate autonomous on-demand power (ODP) systems, where an ODP system automatically determines an application's need and delivers energy appropriately, this includes creating electrical and mechanical designs, algorithms, and embedded software development. ($4.195)

- Molecular Electronics efforts are to engineer and synthesize new materials (molecules) for applications in silicon devices by applying advancements in molecular engineering, materials science and polymer chemistry to address challenges with integrated circuit integration and developing high-reliability semiconductor solutions. ($0.987)

- The Advanced Beam Steering Program efforts are developing next generation beam steering technology. By combining existing technology with novel smart materials, a faster more robust technology will be available for insertion into numerous platforms for increased Warfighter capability. ($0.987)

- Advanced Dynamic Technology Optics Program efforts will begin to develop a new class of smart materials that will provide nanosecond switching speed shutter devices and variable index of refraction devices. These devices will be operated with a microelectronics controller system to ensure that delay in signal processing within the microelectronics will not delay or hamper speed of the device operation. ($0.987)

- Advanced Filter Program efforts are to begin combining new materials with existing optic technology for a nanosecond speed switchable band block/band pass technology over a wide wavelength range. This will provide instantaneous band blocking of damaging radiation of rapidly varying intensity and rapidly varying wavelength to provide an enhanced level of protection for numerous DoD and Homeland defense systems. ($0.987)

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Foliage-penetrating Acoustically Cued Imagery Sensor efforts are developing a miniature digital acoustic array subsystem, imaging subsystem, sensor controller, Line Of Sight (LOS) and Non-LOS communications subsystem, Global Positioning System, chute and payout subsystem, and power subsystems that can be cued to take pictures automatically, compress, encrypt, and infiltrate the image for further analysis and situational awareness at a remote location. Through research and experimentation develop an approach for a jungle based unattended sensor network. Utilize advanced processing and network control to integrate an array of jungle capable sensor for use in high density foliage environments. Develop a prototype and conduct a proof of concept demonstration ($3.355)

- Semiconductor Photomask Technology Initiative efforts are to accelerate the development of state-of-the-art mask making tools and the formation of a domestic mask blank source for future applications in the 45 nanometer and below regime. ($4.195)

- Ruggedized Integrated Battlefield Server efforts are developing and field testing, in the Operation Enduring Freedon area of operations, a spray-cooled ruggedized battlefield server collection management toolset..($9.870)

- Superlattice Nanotechnology efforts are developing and characterizing Silicon Carbide (SiC) wafers grown from SiC templates using low-temperature processes and molecular beam epitaxy with minimum defects that will form the basis for the next generation of radio frequency and radiation-hardened microelectronics. ($2.963)

- Secure Digital Coherent Optical Communications efforts are developing secure optical/radio frequency architecture and operational concepts, study key performance-enhancing algorithms and protocols, and demonstrate key components leading to a secure, high-performance optical communications in fiber, air, and space. ($1.678)

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2006 Accomplishments:

- Advanced Power Management for Wireless Systems efforts are demonstrating autonomous on-demand power (ODP) systems, where an ODP system automatically determines an application's need and delivers energy appropriately, this includes creating electrical and mechanical designs, algorithms, and embedded software development. $1.382)

- Miniaturized Wireless Communications System (Chameleon) efforts are developing a covert self-contained microsensor package with on-board real-time mission critical information processing and an ultra-sensitive high temperature super-conducting transceiver. Designed, developed, and demonstrated a miniature sensor system to be used by soldiers on patrol that gathers audio, video, and GPS data. This data is critical to development of an overall situational awareness of the activities of the local population as seen first hand by the soldiers. ($6.217)

- Ultra-low Power Battlefield Sensor Communication System (ULBPSCS) efforts are developing a netted battlefield sensor system with a combination of ultra-sensitive receivers, ultra-low power miniature sensors, advanced manufacturing processes, and a real-time mission critical distributed information system. Developed algorithms for detection and tracking of personnel and vehicles, miniaturization of hardware, and system power consumption optimization in support of a netted battlefield sensor system with a combination of ultra-sensitive receivers, ultra-low power miniature sensors, advanced manufacturing processes, and a real-time mission critical distributed information system. ($14.806)

- Advanced Lithography efforts are developing reticles using advanced x-ray photolithography techniques capable of being used in a stepper to produce geometrical line-widths equal to or less than 70 nanometers (nm) and upgrade existing stepper system stages for 70 nm applications. (3.346)

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- The Advanced Beam Steering Program efforts are developing next generation beam steering technology. By combining existing technology with novel smart materials, a faster more robust technology will be available for insertion into numerous platforms for increased Warfighter capability. FY07 efforts will investigate and develop proof of concept advance beam steering devices using both lenslet and ionorefractive technologies and demonstrate the applicability of these technologies to the beam steering problem. ($0.996)

- Advanced Dynamic Technology Optics Program efforts will begin to develop a new class of smart materials that will provide nanosecond switching speed shutter devices and variable index of refraction devices. These devices will be operated with a microelectronics controller system to ensure that delay in signal processing within the microelectronics will not delay or hamper speed of the device operation. The FY07 efforts will develop, fabricate, characterize and demonstrate electronically tunable optical filters. ($0.996)

- Advanced Filter Program efforts are to begin combining new materials with existing optic technology for a nanosecond speed switchable band block/band pass technology over a wide wavelength range. This will provide instantaneous band blocking of damaging radiation of rapidly varying intensity and rapidly varying wavelength to make a nanosecond speed switchable band block/band pass technology optical switch to provide an enhanced level of protection for numerous DoD and Homeland defense systems. The FY07 program will investigate and perform theoretical modeling of the Rapid Optical Shutter in order to provide a more thorough understanding of the quantum physics governing the performance of the devices ($0.996)

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Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Advanced Surface Radar Technologies efforts are to support development and adaptation of electronic components to new form factors by expanding surface ship radar electronics miniaturization and packaging methodologies to demonstrate low cost, scalable radar designs. Candidate electronics will be evaluated for potential benefit to supporting the Navy's next generation surface ship radar systems. Presently, the Navy's surface radar systems are monolithic in their design/implementation, requiring the Service to purchase new radar systems (or extensively upgrade existing systems) for any change in the threat they face. New innovations derived from DOD airborne radar development are promising lower cost, modular surface ship radar designs that can be quickly and inexpensively scaled to meet the Service's needs. ($5.529)

- Feature Size Migration are efforts at DMEA's Foundry to provide the fabrication technology, infrastructure modifications and facilitization to build microelectronics with increased functional density using digital, analog and mixed signal processes for military systems in DMEA's foundry. ($4.533)

- Forbes Field Air National Guard (ANG) Regional Defense Command Integration Center efforts are to perform a baseline survey and analysis of ANG capabilities and threats and to correct deficiencies, redundancies and technology gaps relating to emergency disaster management amongst the distributed mission systems of these ANG organizations. ($1.992)

- Foliage-penetrating Acoustically Cued Imagery Sensor efforts are developing a miniature digital acoustic array subsystem, imaging subsystem, sensor controller, Line Of Sight (LOS) and Non-LOS communications subsystem, Global Positioning System, chute and payout subsystem, and power subsystems that can be cued to take pictures automatically, compress, encrypt, and infiltrate the image for further analysis and situational awareness at a remote location. Miniaturization through advanced packaging and design of the prototypes to achieve covertness for the system. Conduct further jungle environment experiments to refine the design and expand the operational characteristics of the system. ($3.586)

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RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Locust Miniature Air Vehicle (MAV) Enhancement efforts are to upgrade the Locust's already exceptional capability to provide full digital communication and video link, ground control station interoperability, increased flight duration, and true multiple plane interoperability. The Locust is an 18 inch unmanned air vehicle (UAV) that is launched by hand. With a range of 5km (3mi) and a flight time approaching 1 hour, the Locust carries an onboard video camera for surveillance. The Locust is completely autonomous and requires no user interaction after launch. ($1.992)

- Mode 5/Mode S Identification Friend or Foe (IFF) System Technology Development efforts are to accelerate technology development and planned implementation of the Mode 5/Mode S Identification Friend or Foe (IFF) System for the Navy's E-2D Advanced Hawkeye (AHE) aircraft. Accelerated technology development of this system in FY07 would help to ensure that all deliverable IFF systems for the E-2D will have Mode 5/Mode S incorporated prior to delivery, significantly shortening the deployment cycle for this capability while allowing for synergy with all phases of program production. Early implementation of Mode 5/Mode S would benefit program risk reduction through analysis and testing while realizing cost savings. ($0.996)

- Superlattice Nanotechnology efforts are developing and characterizing Silicon Carbide (SiC) wafers grown from SiC templates using low-temperature processes and molecular beam epitaxy with minimum defects that will form the basis for the next generation of radio frequency and radiation-hardened microelectronics. The researchers are developing growth techniques for fabricating 3C-SiC and 4H-SiC superlattices on Silicon substrates. In addition, they will characterize the material by fabricating and analyzing power devices using the SiC wafers. This will lead to developing large SiC epitaxial substrates with processes comparable in cost to standard Silicon wafers. ($1.992)

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RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Semiconductor Photomask Technology Initiative efforts are to accelerate the development of state-of-the-art mask making tools and the formation of a domestic mask blank source for future applications in the 45 nanometer and below regime. ($3.586)

- University Materials Characterization and Metrology Center efforts are to identify the chemical and structural elements of materials and devices, as well as chemical, optical, electrical, and physical principles in measurement science and to be an enabler to the nanotechnology industry by providing expertise, training, and making available shared diagnostics equipment. The FY07 efforts will research advanced materials for semiconductor nanowire synthesis, characterization and device development for electronics, thermoelectric cooling and chemical sensing. ($0.996)

- DMEA Core Research efforts are to design, develop, and demonstrate microelectronics concepts, technologies, and applications to extend the life of weapon systems and to solve operational problems (e.g., reliability, maintainability, and performance).and to ensure rapid insertion of transformational technologies into fielded weapon systems by providing the necessary development, manufacturing engineering, and long-term support structure. Research and assess the potential impact to DoD operational systems caused by decreasing microelectronics feature sizes and increasing complexity and develop a mitigation or solution strategy; define and execute a viable long-term solution strategy for access to technologies and processes that are key enablers in the strategy. Proactively determine and develop the potential benefits of utilizing advances in science and technology (e.g., microelectronics, optoelectronics, nanosciences, molecular electronics, etc) to solve DoD microelectronics support issues. Develop and test advanced science and technology applications to acquire in-depth knowledge that is critical in developing solutions to weapons system performance and support problems. Evaluate, and integrate key commercial microelectronics foundry processes and innovative advanced engineering, design, and fabrication process tools to enhance the DMEA capabilities to provide solutions for weapon systems performance and support problems. ($15.940)

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RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Ultra-High Energy Micro Fuel Cell efforts are to evolve fuel cell components to reduce size and weight. The core fuel cell engine will be reduced by design optimization and advanced materials. Electrode materials will be developed to allow the use of advanced high energy liquid fuels to increase performance. The evolution will be focused to make the fuel cell manufacturable in high volume. ($2.590)

- Secure Digital Coherent Optical Communications efforts are developing secure optical/radio frequency architecture and operational concepts, study key performance-enhancing algorithms and protocols, and demonstrate key components leading to a secure, high-performance optical communications in fiber, air, and space. FY07 efforts are to further develop architectures and operational concepts from prior phases into a functional transceiver prototype to demonstrate key sub-system concepts needed to meet the goals of a secure, high-performance optical communications approach for fiber, air, and space. ($2.386)

- Chameleon Miniaturized Wireless Communications System Efforts are developing a covert self-contained microsensor package with on-board real-time mission critical information processing and an ultra-sensitive high temperature super-conducting transceiver. FY07 efforts include another round of major sensor miniaturizations; e.g. reduce by a factor of 10 to 20. To achieve a focused product; three aspects of the Chameleon software must be addressed; 1) the software must be transitioned from a demonstration prototype to field quality product; 2) the data link reliability must be addressed to communicate sensor findings to the command and control; 3) addition of a real-time data streaming mode to augment the current store and forward strategy. ($8.947)

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RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Ultra-low Power Battlefield Sensor Communication System (ULBPSCS) efforts are developing a netted battlefield sensor system with a combination of ultra-sensitive receivers, ultra-low power miniature sensors, advanced manufacturing processes, and a real-time mission critical distributed information system. Transition prototype hardware and software to a production ready status. Complete all qualification testing, and support the execution of a military utility assessment to ensure the system is ready for transition to a military user. Coordinate with military user on the interface of the system into the existing C4ISR network. Develop training and operation material for the military user. ($14.912)

- Spintronics Memory Storage Technology efforts are to achieve a breakthrough in magnetic random access memory (MRAM) technologies together with companion programs in electronics packaging and advanced materials in order to develop a technology that will be produced domestically and will transition from the lab to the battlefield in a timely and cost effective manner ($7.953)

- California Center for Nanoscience Innovation for Defense (CalCNID) efforts are to systematically clarify the feasibility of applying nanoscience and technology to defense requirements. The universities conduct advanced technology research on nanoscale material and devices with applications in electronics, spintronics, nanophotonics, nanosensors and nanobiology. They investigate the feasibility of applying nanoscience and technology to defense requirements. ($9.544)

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Appropriation/Budget Activity RDT&E, Defense-wide BA #3				Microelectronics Technology Development and Support Program Element: 0603720S				
Cost ($ in millions)	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

B. Accomplishments/Planned Program:

FY 2007 Plans

- Silicon 28 Deposition Methodology Project efforts are for a technical and business feasibility analysis for military and commercial applications of silicon-28 (Si-28). A Si-28 gas separation process was demonstrated under a previous Silicon-28 Deposition Methodology project. The study would determine the economic feasibility of the separation process to provide pure Si-28 for military and commercial applications. For example, electronic switches for advanced combat vehicle systems which are being made using advanced silicon-carbide materials. ($0.994)

- Network Micro-Sensors Technology Testbed at University of Texas at Dallas (UTD) efforts are to create a national test bed asset at the UTD for networked micro-sensors technology. Networked micro-sensors technology for use in reconnaissance, surveillance, and tactical applications is a pressing national and border security issue. The technology is planned for use in the Future Combat Systems, U.S. border monitoring, and shipping container security at U.S. ports. Development of this critical technology requires robust testing capabilities, which currently do not exist in the U.S. FY07 plans include developing testbed requirements, developing the systems architecture for the testbed, and developing the hardware and software architecture for the testbed. ($1.093)

C. Other Program Funding Summary: N/A

D. Acquisition Strategy: N/A

Exhibit R-2a, RDT&E Project Justification							Date: February 2007	
Appropriation/Budget Activity RDT&E, Defense-wide BA #3				Microelectronics Technology Development and Support Program Element: 0603720S				
Cost ($ in millions)	FY 06	FY 07	FY 08	FY 09	FY 10	FY 11	FY 12	FY 13
Defense Microelectronics Activity (DMEA)	118.383	92.554	0.000	0.000	0.000	0.000	0.000	0.000
RDT&E Articles Quantity – N/A								

E. Major Performers:

Signal Technology Corp, Plano TX, Signal Technology Corp is the designer of the low power radio (RF communications) and the algorithms associated with radio operation and sensor network formation in several projects. Signal serves as the lead system integrator, which includes overall responsibility for design, integration, and test of the technologies/subsystems. May 2007

University of California at Riverside, Riverside CA, The University of California Riverside (UCR) is performing research in nanotechnology, including spintronics, and the relevant nanomaterials and nanodevices necessary to make applications using this technology a reality. UCR is collaborating with industry and other universities to further the knowledge base in the nanoscience and to transition the research to industry for applications that can be relevant to DoD needs. Sep 2007