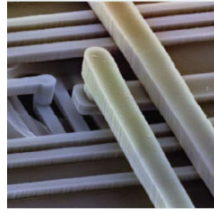


OTHER CAPABILITIES

Besides Radiation Testing, the Defense Microelectronics Activity offers other services to the DoD community.

- Trusted Access Program Office (TAPO) – provides access and Trusted Accreditation to DoD Microelectronics suppliers.
- Advanced Technology Program Support (ATSP) Office – facilitates contracts with DoD Prime contractors in the microelectronics industry.
- Organic Engineering – Reverse Engineering, Part Modification, and Anti-Counterfeiting capabilities available.
- Failure Analysis Capabilities – Hot Spot Detection, FIB/SEM, STEM, IREM
- Six Inch Wafer Foundry – >11,000 ft² cleanroom designed to manufacture High Voltage unobtainable or difficult to procure ICs.



Defense Microelectronics Activity (DMEA) Science and Engineering Gamma Irradiation Test (SEGIT) Facility



The SEGIT Facility provides irradiation test services to the DoD, other government agencies, research labs, universities, and industry. The test facility has two Cobalt-60 J.L. Shepherd & Associates 81-22 Gamma Irradiators. Both irradiators have unique 484 exposure tunnels measuring 41cm (16”) W x 41 cm (16”) H x 102 cm (40”) D. These tunnels are the largest 484 tunnels in the world, accommodating unusually large test articles. A dedicated air conditioning system maintains the irradiator room at a very stable ($\pm 1^{\circ}\text{C}$) temperature and humidity level, allowing the most sensitive test equipment to be used for in-situ testing. Testing is performed in compliance with ASTM F1892 and E1614, MIL-STD-750 TM 1019, MIL-STD-883 TM 1019, IEEE 1156.4, and EIA/TIA FOTP-64.



AGREEMENTS

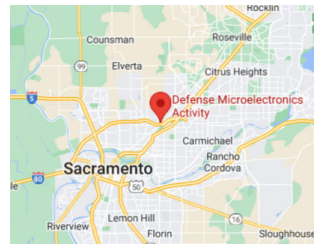
The SEGIT Facility is available to commercial customers, government customers, and educational institutions through a wide range of agreements. Our Contracting and Legal team will assist in facilitating the optimum agreement.

- Cooperative Research and Developmental Agreement (CRADA)
- Public-Private Partnership (PPP)
- Educational Partnership Agreement (EPA)
- 7600A/MIPR

LOCATION MAP

The SEGIT Facility is located approximately 15 minutes northeast of Sacramento, California.

4234 54th Street, Building 620
McClellan, CA 95652-2100



CONTACT US

SEGIT Facility Manager

Tom Shepherd
916-231-1635

Radiation Testing Branch Chief

John Allgair
916-999-2643

Email: osd.mcclellan-park.dmea.list.segit@mail.mil

| Parameter | High Dose Rate Irradiator | Low Dose Rate Irradiator |
|---------------------|--|--|
| Source | Cobalt-60, 1.17 and 1.33 MeV | Cobalt-60, 1.17 and 1.33 MeV |
| Dose Rate | 1.0 rad(SiO ₂)/min to 50krad(SiO ₂)/min* | 0.5 rad(SiO ₂)/min to 250 rad(SiO ₂)/min |
| Cavity Volume | 16"x16"x40" Custom 484 tunnel | 16"x16"x40" Custom 484 tunnel |
| MIL-STD-883 | TM 1019 Cond A, B, C | TM 1019 Cond B ,D, E |
| Synergistic Testing | Yes | No |

* Represent current achievable dose rate based on source decay.

DOSIMETRY

All dosimetry is accomplished using NIST-traceable, ISO 17025 calibration-level therapy class Radcal ionization chambers. Dosimetry is only used for a limited time to ensure that any anomalies in source output or ion chamber response are documented and addressed in a timely manner. Three sizes of ion chambers (low range, mid range and high range) ensure coverage for the full range of dose rates available in the SEGIT irradiators, all used with a Radcal Model 9010 Radiation Monitor Controller:

Low range: Radcal Model No. 90X6-60 Ion Chamber/Electrometer

Mid range: Radcal Model No. 10X5-6-3 Ion Chamber + Radcal Model No. 9060A Electrometer

High range: Radcal Model No. 90X5-0.18 Ion Chamber/Electrometer

DISTRIBUTION A. Approved for public release; distribution unlimited

ISO/IEC 17025:2017 ACCREDITATION

ISO/IEC 17025:2017 is the primary international standard for general requirements for testing and calibration laboratory competence. The SEGIT Facility has maintained ISO17025 accreditation since 2001 and remains the only DoD Total Ionizing Dose testing facility to do so.



Testing Certificate
No. 1691.01

SYNERGISTIC EFFECTS TESTING CAPABILITIES

DMEA's SEGIT Facility has two Dewar Temperature Systems which can be placed within the High Dose irradiator to perform synergistic testing with combined environments of radiation and temperature, humidity, and/or vacuum. These high-stability environmental chambers contain a large 21cm (8.3") inner diameter, 28cm (11") deep cylinder for placing the test article. The chambers are fitted with feed-through ports that allow test articles to be externally powered and/or monitored during testing.

Dewar Temperature System I

- -150 °C to +150 °C ($\pm 1^\circ\text{C}$)
- 10-2 to 10-3 Torr Vacuum
- 8.3" Inner Diameter x 11" Deep Chamber

Dewar Temperature System II

- -150 °C to +150 °C ($\pm 1^\circ\text{C}$)
- 10-3 to 10-6 Torr Vacuum (Controllable)
- Rate Controllable to 100 °C/hr
- 20% to 80% Humidity
- 8.3" Inner Diameter x 11" Deep Chamber



ELECTRICAL CHARACTERIZATION

DMEA's Device, Circuit & System Test Branch provides support to the SEGIT Facility. A vast array of on-site microelectronics test equipment is available for use.

Circuit Test

DMEA leverages the Advantest V93000 for pre and post exposure testing.

- 512 IO channels at 800MHz
- Voltage Range: -40V to 80V
- Current Range: 200 mA @ $\pm 10\text{V}$
- Mixed signal capability



Memory Testing

DMEA uses a Marvin Test Solutions GX7600 Portable Memory Tester for in-situ memory testing

- 64 channels
- 8MB vectors per channel
- Voltage Range: $\pm 20\text{V}$
- Current Range: up to 1A

Custom Benchtop Testing

DMEA can create a variety of custom test set ups utilizing LabVIEW controlled bench top equipment.

- RF signal analyzers/generators
- Power analyzers/supplies
- Oscilloscopes.

Device Test

DMEA utilizes the Keithley 4200-SCS Parametric Analyzers for in-situ characterization.

- I-V Measurements
- C-V Measurements
- AC Impedance testing
- 48 channel switching matrix
- Voltage Range: $1\mu\text{V}$ to 210V.
- Current Range: 0.1fA to 1A

Environmental Chambers

DMEA has multiple chambers available for annealing and other custom environmental tests.

Temperature Shock (TSE-11A)

- Low: -0 to 65°C
- High: 60 to 180 °C
- Internal Dimensions (W x D x H)
12.6" x 9.05" x 5.83"

Temperature and Humidity (BTX-475)

- -70 to 180°C
- 10% to 95% RH
- Internal Dimensions (W x D x H):
29.6" x 33.4" x 45.6"

Printed Circuit Board Design

DMEA can design custom Printed Circuit Board Design for most applications to fit a large array of customer needs