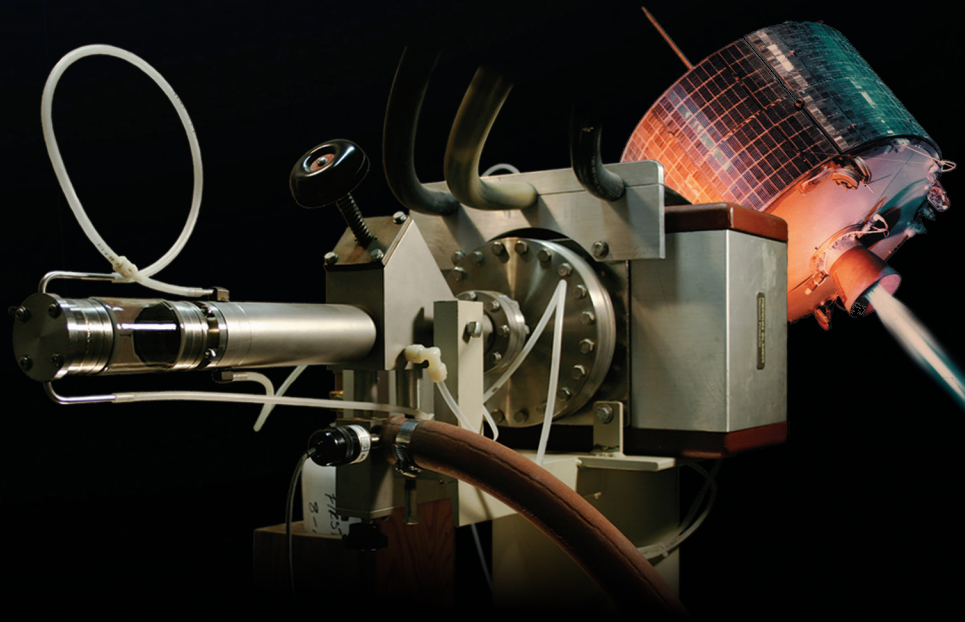


MIL-STD Radiation Effects Test
Services

Device Screening and Element
Evaluation

Device Preparation for Single Event
Effects Testing

Quick-Turn Prototype IC Assembly



Comprehensive radiation effects test and support



Cobham RAD Solutions (formerly Aeroflex RAD) has obtained Lab Suitability by DLA (Defense Logistics Agency) for radiation testing to both MIL-STD-750 and MIL-STD-883 and own and operate a full suite of radiation and electrical test equipment. Cobham RAD Solutions operates as an independent division to maintain the integrity for customers that may have company sensitive products and information. With the support of Aeroflex and now Cobham, our new 36,000 sq/ft facility is fully operational and able to support more testing with quicker turnaround times for our customers.

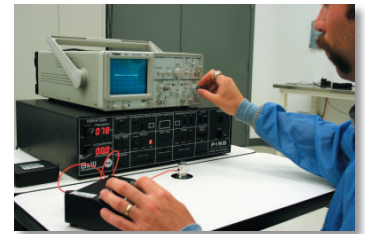
– Joseph Bennedetto, VP, Radiation Technology

MIL-STD Radiation Effects Test Services

- Total Ionizing Dose (TID) RLAT (50 to 300 rads/sec)
 - MIL-STD-883 TM 1019, Cond. A
- TID ELDRS (10 to 100 mrads/sec)
 - MIL-STD-883 TM 1019, Cond. D, ESA/SCC22900
- Prompt Dose / Flash X-Ray Tests
 - MIL-STD-883 TM 1020 and 1021
- Neutron Displacement Damage Tests TM 1017
- Heavy Ion SEE Tests (SEL, SET, SEGR, SEU, SEB, SEFI)
- Proton SEE and Displacement Damage Tests
- 1 MeV Pelletron
- Cryogenic FPA testing (25 K)

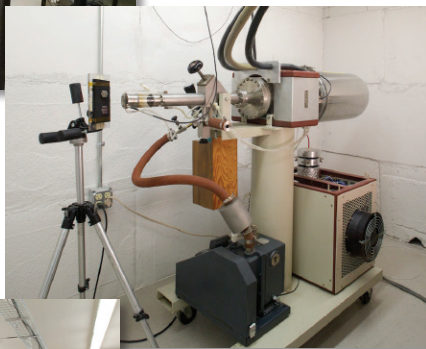
Device Screening and Element Evaluation

Cobham RAD Solutions offers comprehensive screening services for your flight devices, lot conformance, and individual die element evaluation.



Screening Test Method Capabilities

Test Description	MIL-STD Test Methods	
	883	750
Adhesion of Lead Finish	2025	n/a
Bond Strength	2011	2037
Burn-in	1015	1039
Constant Acceleration	2001	2006
Die Shear	2019	2017
External Visual	2009	2071
Hermeticity	1014	1071
Internal Visual	2010	2072
Internal Water Vapor	1018	1018
Lead Integrity	2004	2036
Lid Torque	2024	n/a
Mechanical Shock	2002	2016
Moisture Resistance	1004	1021
Physical Dimensions	2016	2066
PIND	2020	2052
Radiography X-ray	2012	2076
Resistance to Solvents	2015	1022
Salt Atmosphere	1009	1041
Solderability	2003	2026
Steady State Life	1005	1026
Temperature Cycling	1010	1051
Thermal Shock	1011	1056
Vibration Variable Frequency	2007	2056



Device Preparation for Single Event Effects Testing

Preparation for Single Event Effects testing can be quite demanding for both thinning and part de-capping. Cobham RAD Solutions has invested in specialized equipment and a proprietary processes to meet these demands. This cost efficient process provides results our customers can depend on. Using the UltraTec thinning process and verification with the highly accurate Precitec interferometer, yields are significantly increased while also increasing the confidence in the results of the SEE test.

Finished Package Backside Thinning

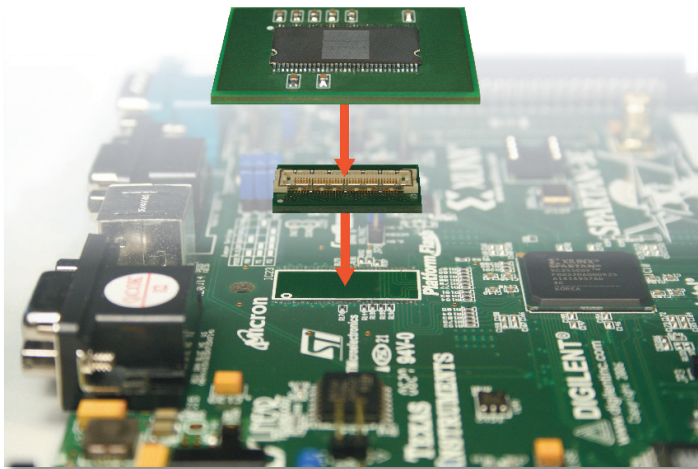
- Package backside thinning to $45\mu\text{m} \pm 5\mu\text{m}$
- Custom PC board design in preparation for SEE Testing
- Custom DUT Socket Solutions for SEE Testing of multiple interchangeable ICs for at-speed testing on a test board

Die Thinning

- Die thinning and verification is available as required to any thickness ($\pm 5\mu\text{m}$)

Die Extraction / Repackaging

- When package backside thinning is not a solution, we routinely perform die extraction and repackaging in preparation for SEE Testing
- Custom PC board design for SEE testing is available



Single Event Effects (SEE) Testing

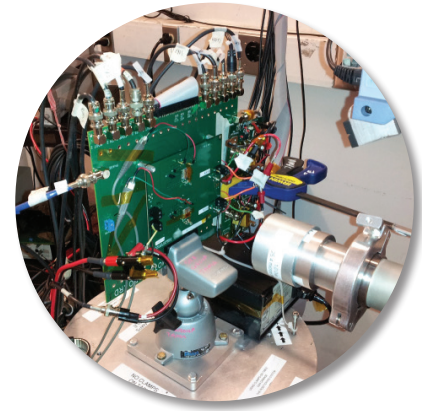
Cobham RAD Solutions has extensive experience in performing Single Event Effect tests. Many of our staff have over 25+ years of experience in the relatively unique and specialized field of single event effects in electronics. This experience, combined with the many hundreds of tests we have performed, has led to the development of a library of hardware and software techniques which help reduce the cost and time required to successfully complete an SEE test.

We offer turnkey solutions to efficiently determine heavy ion cross sections for a given component or system from diodes to FPGAs and DSPs. Our services include:

- Device Preparation — thinning, back side thinning and packaging if required
- Design and Development of test hardware & software
- Optimized test planning and management for efficient use of the cyclotron
- Comprehensive SEE test reports and data collection

Single Event Effects Tests

- Single Event Latch Up (SEL)
- Single Event Upset (SEU)
- Single Event Transients (SET)
- Single Event Burnout (SEB)
- Single Event Functional Interrupts (SEFI)
- Single Event Gate Rapture (SEGR)
 - EIA/JESD 57
 - ASTM F1192



SEE Testing of memory devices, including NAND, SDRAM and DDR, is efficiently performed using our FPGA based test solutions. The majority of SEE tests are conducted using cyclotrons at either Lawrence Berkeley National Laboratory (LBNL) or at Texas A&M University (TAMU) and on occasion at Brookhaven National Laboratory (BNL).

Quality

- DLA Lab Suitability for radiation and screening test methods listed
- ISO 9001:2008 Certification

Cobham RAD Solutions (formerly Aeroflex RAD) now offers radiation test services for customers and programs outside of the US using test methods compliant to either MIL-STD-883 or ESCC Basic Specification No. 22900. Our ELDRS cell can run any dose rate from 1 to 100mrad(Si)/s to match the mission requirement. Cobham RAD Solutions's Harwell, UK facility can also provide radiation testing for customers outside the US.

Key benefits:

- Typical four week cycle time for RLATS
- Full complement of test capabilities
 - Neutron
 - ELDRS
 - TID high dose
 - Electrical test
 - Legacy international mission support
 - Test hardware in place for most device types

Quick-Turn Prototype IC Assembly

Cobham RAD Solutions offers the following services: Quick-Turn Prototype IC Assembly in ceramic, etched out plastic, COB and flip chip.

Quick-Turn Prototype IC Assembly Capabilities

- Dicing, Die Visual and Die Attach
 - Wafer Dicing (up to 12inch wafers)
 - Visual Inspection (50-500X)
 - Conductive and non-conductive epoxy die attach
 - Silver Glass and Eutectic die attach
 - Flip Chip
- Wirebond, Encapsulation and Marking
 - Gold and Aluminum Wirebond (to 45µm pitch)
 - Epoxy, Solder, and Glass Frit Lid Seal
 - Dam and Fill (Plastic Encapsulation)
 - Plastic Equivalent Devices
 - COB Glob Top
 - Package Ink Marking or Laser Marking

■ Package Options

- Multi-chip / Stacked Modules, Chip-On-Board (COB), and Custom Substrates
- Ceramic Packages Including: BGA, PGA, J-Lead, Flat Pack, QFP, Sidebrazed, CERDIP and others
- Etched Cavity Plastic Packages Including: J-Lead, QFP, SOIC, TSSOP, QFN / MLF and others



The most important thing we build is trust.

COBHAM

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