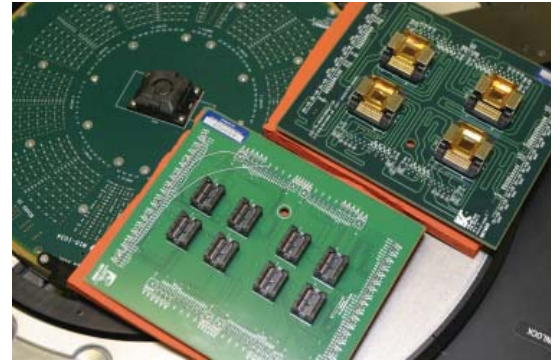


Semiconductor Services



ENGINEERING, ANALYTICAL & LABORATORY ASSEMBLY: TURN KEY & BUILD TO PRINT
FAILURE ANALYSIS
PROGRAM MANAGEMENT
DMS / EOL SUPPORT
WAFER PROCESSING

TEST: ELECTRICAL & MECHANICAL
CUSTOM PACKAGE DESIGN
BURN-IN / LIFE TEST
ENVIRONMENTAL SCREENING
DEVICE UP-SCREENING
COTS UP-QUALIFICATION

It is our goal at Microcross Components to provide our customers with a full service solution to their product and manufacturing needs. This includes full turnkey requirements as well as isolated activities and screening. Our resources are available to address needs regardless of the magnitude of the request. We have an extensive range of capabilities, including design, assembly, screening, and final processing to military and space quality standards. This allows Microcross Components to be the premier world-wide supplier of state-of-the art semiconductor products for high-reliability applications. Our in-house technical expertise allows us to design new parts and processes very quickly. If you have a service requirement that is not found below, our technical staff can assist in developing a solution for you.

ENGINEERING & ANALYTICAL SERVICES

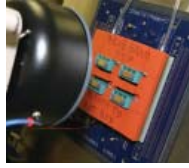
- Component, Evaluation and Qualification
- Package and Sub-assembly Design
- Device Characterization
- Infant Mortality Testing
- Sonoscan (CSAM), X-Ray
- Stud Pull, Bond Pull
- Moisture Resistance
- Steam Age/Solderability
- Salt Spray
- Thermal Shock/ Thermal Analysis
- PIND
- Lead Failure
- Temperature Cycling
- Hermetic Testing
- SPC, Technical Support
- SEM Inspection
- Centrifuge
- Mechanical Shock and Vibration

MEMORY DEVICE CHARACTERIZATION

- -65°C to 150°C & Higher Temperatures
- Bit Map
- Parameter Shmoo
- Average & Standard Development (4-corner Characterization)
- Parameter MARGIN
- ICC's over Temperature & VCC
- DC Parameters (Nano-Amp Precision)
- VCC Functional vs. Temperature
- Special Algorithm (Application Specific)
- Sensitivities or Intermittences
- Noise Margin Performance
- Data Retention Fail Threshold
- Speed
- Timing Sequence (Race Conditions Concerns)
- New Silicon Design Proof
- COTS / PEMS (Plastic Upscreen)

ELEMENT EVALUATION

- SEM, WLAT
- 30X - 200X Internal Visual
- Bit-Mapping
- Bond Pull
- Die Shear
- Lid Torque
- Lead Integrity
- X-Ray
- Construction Analysis
- Single-Bit F/A De-Process
- ESD Testing



MECHANICAL

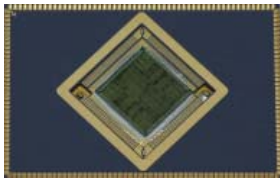
- Sonoscan
- PIND
- Gross & Fine Leak
- Marking & Permanency
- Steam Age / Solderability
- Hot Pb / Sn Solder Dip
- Vibration Fatigue
- Lead Time / Forming
- Centrifuge to 40,000g
- Mechanical Shock

FAILURE ANALYSIS

- I/C Electrical
- Characterization
- Decapsulation
- Dye Penetrant
- X-Ray
- Energy Dispersive X-Ray
- Scanning Electron Microscope
- Optical Microscope
- Curve Tracer
- O/S Test
- Scanning Acoustic Microscope



CUSTOM PACKAGING & PRODUCT DESIGN



Micross Components has loyally served the Military & Hi-Rel custom assembly and test marketplace for over 22 years. Custom support has been the company foundation since its inception, with the philosophy that if it can be defined by the customer, Micross will support the RFQ.

No semiconductor device is too simple or too complex, as the products supported over the years have spanned from diodes to Giga-bit 800Mhz memory devices. Micross Components also consistently attends to the special high reliability process and ceramic packaging interest of the satellite and space community.

Micross has always striven for high quality standards in serving space customers, having achieved class 'V' for MIL-PRF-38535 and currently pursuing Class 'K' for MIL-PRF-38534. In fact, Micross was the first non-OEM company QML certified by DSCC. This tradition of quality standard has formed the pillars of Micross success in this unique and special custom marketplace.

DESIGN CAPABILITIES:

Silicon Experience

- Linear
- Mixed-Signal
- Analog
- Digital
- Memory

Standard Packages

- Hermetic
 - DIP
 - ZIP
 - SOJ
 - QFP
- Plastic
 - PGA
 - LCC
 - PGBA
 - PLCC

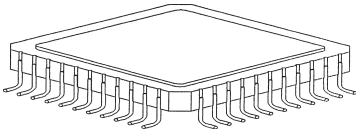
Custom Packages

Per Requirement

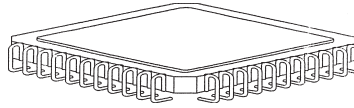
DOMESTIC ASSEMBLY

- Multi-chip Module / Monolithic
- Three Clean Rooms
 - Class 100
 - Class 1000
 - Class 10,000
- Die Material - Silicon, SOS, GaAs, SiC
- Wafer Processing
 - Disco Dicing equipment
 - Cut range up to 8" or 200mm DIA
 - Die sorting – automatic pick and place
 - Wafer maps converted/uploaded to ALPS for binning, sorting to gel pack, waffle pack, or directly packaged
- Automatic Die Attach - JM7000
 - Eutectic
 - Epoxy
 - Solder
- Auto/Manual Wire Bonding
 - K&S and F&K Delvotec automatic wire bonders
 - 0.7 to 3.0 mil Aluminum Ultrasonic
 - 0.7 to 2.0 mil Gold Thermo sonic
- Bond Pull –Destruct / Non Destruct
- Hermetic Seal
 - Gold-tin eutectic solder reflow
 - Parallel Seam Seal
 - Resistance welding – TO packages
 - Glass frit seal
- Solder Re-flow
- Vacuum Bake
- Lead Attach, Trim & Form

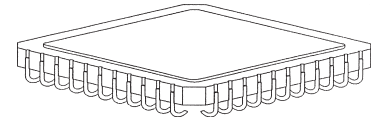
LEAD ATTACHMENT SERVICES



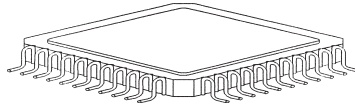
Gullwing - JEDEC MO-111



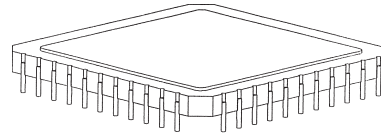
Spider J-Form



J-Form - JEDEC MO-110



Spider Gullwing



Butt-Form

TEST CAPABILITIES

Micross Components engineering staff is experienced and ready to service your electrical evaluation and device reliability testing needs, including infant mortality “burn-in” screening and upscreening of commercial plastic components. Micross has built a large foundation of test program libraries on a multitude of test platforms with base programs numbering in the thousands, and test hardware fixtures for many hundreds of unique, ceramic and plastic packages and pin counts.

If you are looking for increased reliability assurance and your requirements entail burn-in, or life test, Micross Components has several large capacity ovens, especially suited for dynamic, or static bias excitation with already tooled burn-in boards for multitude of devices and packages.

TESTER CAPABILITY

- Teradyne J997-100/200 MHz, 72 I/O's
- 5 Teradyne J937-50/100 MHz, 36 I/O's
- SZ M3000 - Multi-Family Test System
- Sentry VII – 10MHz, 60 Pin High Speed Head, 60 Pin High Voltage Head
- 2 Automated Bench Test Systems
- LTX TS80 – Linear / Mixed Signal Test System
- 2 Sentry 21 – 20MHz, 120 Pin High Speed Head, 60 Pin High Voltage Head
- Testronics 201C – Discrete Component Test System
- Sub-Nanosecond ECL Logic AC Test System
- Automated Handlers
- Large Variety of Standard Bench Test Equipment and High Precision Equipment

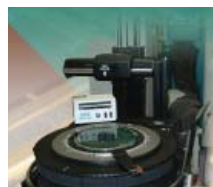
BURN-IN/LIFE TEST CAPABILITY

- Dynamic / Static
- Accelerated VCC
- Arrhenius / FIT Rate Calculation
- 100°C, 125°C, 135°C, 145°C
- Logic, Linear, PLD, VLSI
- All Memory Devices
- Infant Mortality EFR
- Functional Check In-Situation
- PDA / Parameter Drift
- Data Retention / Endurance
- 5 Large-Capacity Memory Burn-In Ovens
- 4 Custom Product Burn-In Ovens
- 3 Auxiliary Custom Product Ovens



PRODUCT TESTING

Micross has experience in testing a wide range of both memory and logic/linear/VLSI products, and maintain a large library of test programs under strict quality control standards.



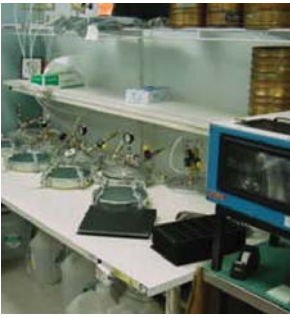
MEMORY / MEMORY MODULES

- SRAM / SSRAM
- DRAM / SDRAM
- VRAM
- EEPROM / FLASH
- FIFO
- Dual-Port RAM
- VLSI / Logic

ELECTRICAL TEST

- -65°C to +150°C
- Group A
- Correlation / Gold Standard
- Modules
- Attributes Data
- Logic, Linear, PLD, VLSI
- All Memory Devices
- Precision High Speed
- Low-Noise PWB Design
- Discrete Components

ENVIRONMENTAL / STRESS SCREENING



Micross Components can perform environmental / stress screening and assembly evaluation tests required by the high reliability semiconductor market.

- Environmental / Stress Screening
- Temperature Cycling
- Centrifuge
- Fine / Gross Leak Testing
- Marking / Resistance to Solvents
- HAST Testing
- Lead Trimming / Forming and Lead Integrity

TESTING:

- Shock / Vibration Testing
- PIND Testing
- Half-Sine Shock Testing
- X-Ray / Sonoscan Evaluation
- Trained Operators
- Experienced Analysis

SPACE PRODUCTS & CAPABILITIES

- RADIATION TOLERANT PACKAGING
- MONOLITHIC & MULTI-CHIP MODULES
- DSCC QML CERTIFIED
- MIL-PRF-38535 V-LEVEL ASSEMBLY
- MIL-PRF-38534 CLASS K CERTIFICATION (IN PROGRESS)
- EEE-INST-002 & NSTS 5300.4
- MILITARY & SPACE CUSTOMERS ARE OUR PRIMARY FOCUS
- DMS & EOL SUPPORT
- MIL-STD-883 METHODS SERVICE PROVIDER FOR SINGLE STEP OR FULL FLOW
- BROAD COMPONENT EXPERTISE
- HIGHEST LEVEL OF QUALITY & CUSTOMIZED SUPPORT
- CUSTOMIZED CUSTOMER SCD's



Micross has been supporting the space and satellite market with specialized and standard products for over 22 years. Parts have been designed into hundreds of programs and tens of thousands of devices have shipped to date.

Additionally, Micross can readily support new business with minimal to possibly NO NRE charges. In today's competitive satellite market, this can net an overall system cost advantage that may give our customers a contract bid edge. Coupled with exclusive commitment to ONLY the Military and Aerospace customer, Micross provides FOCUSED support to this unique and specialized market place and believes in personalized and dedicated customer service.

QUALITY LEVELS AND PROGRAMS

Our Quality Data System employs a multi-faceted, comprehensive, all electronic system for managing and maintaining quality related information. It rolls together every aspect of maintaining, administering, recording and reporting that is required for the utmost in real-time quality management. The system is focused on problem prevention, rather than depending on detection and correction. Micross has always striven for high quality standards, having achieved class 'V' for MIL-PRF-38535. Currently Micross is pursuing Class 'K' for MIL-PRF-38534 for programs demanding space level processing for hybrids and memory modules. Micross was the first, non-OEM supplier to be QML certified by DSCC. We are regularly audited by DSCC and our customers, as well as the various DOD agencies. Visits to our facility are openly welcome.

- DSCC QML
 - MIL-PRF-38534, Class H (Class K in process)
 - MIL-PRF-38535, Class Q
 - MIL-PRF-38535, Class V (assembly only)
 - Laboratory Suitability (MIL-STD-883)
- SMD, Q level and M level
- NSTS 5300.4
- EEE-INST-002
- MIL-STD-883, paragraph 1.2.1
- Capabilities for Class S Manufacturing
- AS9100:2004 , ISO 9001:2008 Certified
- Customer specific, Source Control Drawing (SCD)
- Referenced Standards
 - MIL-PRF-38535
 - MIL-PRF-38534
 - MIL-STD-883
 - MIL-PRF-19500
 - MIL-STD-1835



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