Criteria Labs provides world-class advanced packaging assembly services to meet all your design requirements. We can take you from prototype design to high-volume production. Whether you have a simple monolithic process, high-technology mix, chip on board with surface mount technology or complex multi-chip or opto assemblies, Criteria Labs can meet all your assembly specifications.

**Engineering:**
Criteria Labs has assembled world-class design and engineering teams to solve your complex problems.

**TURNKEY**
- Product engineering
- Program management
- Advanced interconnect development
- Packaging and development of interconnection technologies
- Process development for advanced technology
- Qualification plan development
- Construction analysis
- Semiconductor failure analysis

**SOFTWARE**
- Characterization and validation of new silicon (digital, mixed signal, discrete components, i.e. transistors, diodes and RF)
- Test plan and design for testability, probe and final test (digital, mixed signal, discrete components, i.e. transistors, diodes and RF)
- Test analysis for yield improvement

**HARDWARE**
- Test analysis for test time reduction
- Conversion between different ATE platforms (digital and mixed signal)
- Probe card design including spider
- Load board design (low frequency to high frequency)
- Burn-in
- DUT/probe interface boards
- Tape pocket design (for tape & reel services)
- Handler kit/interface

**PROCESS ENGINEERING FOR MICROELECTRONIC PACKAGING**
- Hybrids
- Chip on board designs (COB)
- Advanced packaging
- Flex boards
- Smart cards
## Services:
Criteria Labs provides a broad array of in-house services to reduce your time to market, verify quality and make sure what's being shipped meets your exact specifications.

### WAFTER TEST, FINAL TEST and TEST ENGINEERING SERVICES
- Wafer probe from -55°C to +175°C
- Off line inking
- Final semiconductor package electric test -55°C to +175°C
- Wafer mapping
- Data logging and yield monitoring with feedback to customer
- Laser marking
- Package inspection

### DIE PROCESSING
- Wafer saw (2” to 8”)
- Wafer sort
- Visual inspection (*MIL-STD 883 Method 2010 A or B*)
- Die mapping
- Wafer wash/ink removal
- Die sort duals, trios and quads
- Die to wafer pack/GEL pack
- Die to tape
- Bar code labels
- Special packing

### PACKAGING
#### COMMERCIAL, MEDICAL CUSTOM, CERAMIC AND PROTOTYPE
- Ceramic dips, flat packs, LCC, CERQUAD, CERPAC, ceramic SOIC
- BGA, CQFP, CPGA, TO-CAN, METAL CAN
- Sidebraze, JLCC
- Multi chip module (MCM), hybrids, chip on board (COB)
- Flex assembly, smart cards, FR4 chip bonding
- MIMS assembly
- Opto assembly
- Die attach material
  - Silver glass: QMI 2569 conductive
  - Silver-filled cyanate ester: JM-7000 and QMI-84-1 or 3 (conductive or nonconductive)
  - Silver-filled epoxy
  - Electrically insulating epoxy
  - Low-temp cure epoxies
  - Eutectic:
    - 2% silicon 98% gold preform
    - 80% gold 20% tin preform
- Sealing and encapsulation
  - Solder sealing (gold-tin eutectic) and glass sealing
  - Resistance welding for metal cans
  - Glob topping with hysol material on custom packages
  - Seam seal
  - Taped lids
  - B-stage epoxy attachment
- Assembly testing (quality conforms or exceeds military requirements)
  - Die shear strength
  - Bond pull
  - Non-destructive bond pull (Class S)
  - Fine and gross leak testing
  - Constant acceleration (centrifuge)
  - Solderability
  - Temperature cycle
  - Resistance to solvents
  - External visual
- Lab suitability qualification services
  - Solder dip
  - Lead trim and form/manual
  - Lead inspection and repair
  - Temperature cycle
  - Constant acceleration (centrifuge)
  - Fine and gross leak
- Resistance to solvents testing
- Marking
- Demark and remark
- Ball shear
- Bond pull
- Die shear

PRODUCT ASSEMBLY QUALIFICATION

> Environmental Tests
  - Steady state life test (Method 1005)
  - Thermal shock (Method 1011)
  - Temp cycling (Method 1010)
  - Burn-in (Method 1015)
  - Moisture resistance (Method 1004)
  - Fine/gross leak testing (Method 1014)
  - Internal water vapor content (RGA) (Method 1018)
  - Salt atmosphere corrosion (Method 1009)

> Mechanical Tests
  - Physical dimensioning (Method 2016)
  - Marking: stamp or laser
  - Marking: resistance to solvents testing (Method 2015)
  - Solderability (Method 2003)
  - Bond strength (destructive bond pull) (Method 2011)
  - Mechanical shock (Method 2002)
  - Vibration, variable frequency (Method 2007)
  - Vibration random (Method 2026)
  - Constant acceleration (centrifuge) (Method 2001)
  - Adhesion of lead finish (Method 2025)
  - Lead integrity (Method 2004)
  - Lead torque
  - Particle noise impact detection (PIND) (Method 2020)
  - Bond shear
  - Die shear strength (Method 2019)
  - Lid torque for glass fit sealed packages (Method 2024)
  - Visual per MIL-STD-883

> Process testing
  - Latch up/electrical overload stress (EOS)
  - Electro static discharge (ESD) HMB, MMB & CDM

ELECTRONIC DEVICE PHYSICAL EVALUATION AND ANALYSIS

> BGA and uBGA automatic ball inspection
> Bond pull
> Die shear
> Solder dip
> Lead trim
> Lead inspection and repair
> Solderability restoration
> Bake and dry pack

RELIABILITY ANALYSIS OR FAILURE ANALYSIS

> Acoustic microscopy (CSAM)
> Focus ion beam (FIB)
> Scanning electron microscope (SEM)
> X-ray
> Real-time X-ray
> Cross sectioning
> Micro-probe
> Light emission microscopy
> De-cap (wet) manual/acid jet etcher
> Construction analysis
> Parallel polishing
> Back lapping
> Latch up/electrical overload stress (EOS)
> Electro static discharge (ESD)
> Level 1, 2 and 3 failure analysis
> EDX
> Digital image capture
> Solderability testing
TAPE & REEL SERVICES

- Tray to tape, QFP, TSOP, BGA, uBGA, FBGA, QFN
- Tube to tape, SOIC, PLCC, SOJ, SOMC, SSOP, TSSOP, MSOP, VSOP, QSOP, QVSOP, DP4AK, DPAK, TO263, PLCC SOCKETS, MLF, MLP
- Bulk to tape SOT, CHIP RESISTORS/CAPACITORS
- Tray to tray
- Tube to tube
- Lead scan trays
- Lead scan tubes
- Satellite facilities available in some locations
- 3-D laser scanning: QFP, TSOP, BGA and uBGA
- 3-D vision system: SOIC, TSSOP, SSOP, MSOP, VSOP, QSOP, QVSOP, SOMC
- 2-D: QFP, TSOP, PLCC, BGA and uBGA
- Lead conditioning
- In-line mark inspection
- Parts marking
- Tape custom packages (Criteria Labs will custom design tape pocket)
- Bar coding and custom bar coding
- Labeling and custom packaging
- Laser mark capability
- Detape
- Bake and dry pack

QUALITY SYSTEMS

- Total Quality Management Program
- Incoming inspection of consigned and turnkey products
- 100% ESD controlled environment
- Packaging process to customer specifications
- QA sample inspection or 100% based on customer requirements
- SPC controlled in critical processes
- 8D corrective action
- Employee training and certification
- Equipment calibration schedule
- Document control
- Final gate inspection (AQL or LTPD)
- CFC and summary data reports

CERTIFICATIONS and COMPLIANCE PROCESSES

- ISO-9001/2000
- QML-PRF-38535 Certified
- MIL-STD-883 Certified
- IPC 610 Class I, II, III Certified
- MIL-PRF-19500 Compliant
- MIL-STD-750 Compliant
- Classified Facility Controls
- EIA 485 Compliant
- EIA 481 Compliant

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