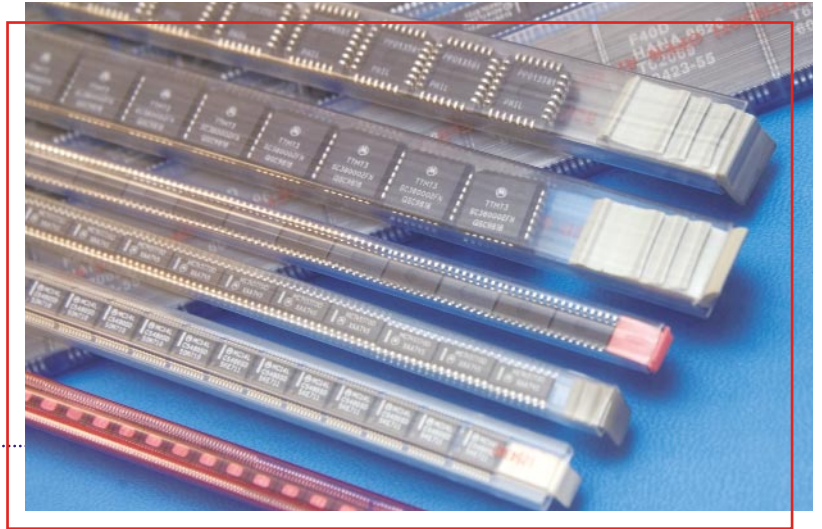


## Specialty Services



Criteria Labs provides value-added services for distributors, contract assembly companies and other organizations requiring specialized semiconductor services. Whether you need just one of our world-class services or full turnkey capability, Criteria Labs wants to be a partner in your success. Our services include:

- Detape and retape parts that have damaged reels or are out of moisture compliance
- Tape & reel loose or bulk components
- Programming of proms and device marking
- Counterfeit parts detection
- Up screening of out-of-tolerance devices
- Obsolescence or reverse engineering

### Engineering:

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

#### TURNKEY

---

- > Product engineering
- > Process development for advanced technology
- > 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)

#### HARDWARE

---

- > Load board design (low frequency to high frequency)
- > Burn-in/HAST board design
- > DUT/probe interface boards
- > Tape pocket design (for tape & reel services)

#### PROCESS ENGINEERING FOR MICROELECTRONIC PACKAGING

---

- > Hybrids
- > Chip on board designs (COB)
- > Advanced packaging
- > Flex boards
- > Smart cards

# SPECIALTY SERVICES

## 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.

### FINAL PACKAGE DEVICE TESTING AND TEST ENGINEERING SERVICES

- > Final semiconductor package electric test -55° C to +175° C
- > 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 waffle pack/GEL pack
- > Die to tape
- > Bar code labels
- > Special packing

### PRODUCT QUALIFICATION TESTING FOR PLASTIC ENCAPSULATED DEVICES

(JEDEC AND AEC STANDARD USED IN AUTOMOTIVE APPLICATIONS)

- > Environmental Tests
  - Pre-conditioning of plastic surface mount devices prior to reliability testing (Method A113)
  - Moisture sensitivity test for plastic surface mount devices (Method A112)
  - Lead-free re-flow charting and validation to JEDEC-22 or Japanese automotive requirements (green mold compound)
  - Temperature cycling (Method A104)

- Steady state life test/1000 hour burn-in (Method 108A)
- Temperature humidity bias testing (Method A101)
- Autoclave – accelerated moisture resistance – unbiased (Method A102)
- Moisture resistance
- Thermal shock (Method A106)
- Highly accelerated temperature and humidity stress test (HAST) (Method A110)
- High-temp storage (HTS)
- Salt atmosphere (Method A1107)
- High-temp operating life (HTOL) (biased/unbiased)
- THB 85° C/85% RH
- > Mechanical Tests
  - Physical dimensions (Method B100)
  - Vibration, variable frequency (Method B103)
  - Mechanical shock (Method B104)
  - Lead integrity (Method B105)
  - Solderability (Method B102)
  - Resistance to soldering heat (Method B106)
  - Resistance to solvents (Method B107)
- > Process Testing
  - Latch up/electrical overload stress (EOS)
  - Electro static discharge (ESD) HMB, MMB and CDM

### DESTRUCTIVE PHYSICAL ANALYSIS (DPA)

IN ACCORDANCE WITH MIL-STD-1580

- > External visual (Method 2009)
- > Radiographic inspection (Method 2012)
- > Hermetic seal testing (Method 1014)
- > Internal visual inspection (Method 2010, condition B)
- > Bond pull testing (Method 2011)
- > Scanning electron microscopy (SEM) (Method 2018)
- > Die shear testing (Method 2019)
- > Photograph of the internal construction and pad locations
- > Summary report

---

## 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

## ELECTRONIC DEVICE PHYSICAL EVALUATION AND ANALYSIS

---

[JEDEC OR MIL-STD-883]

- > Counterfeit parts evaluation
- > Lead free re-flow charting and validation to JEDEC-22 or Japanese Automotive requirements (green mold compound)
- > BGA and uBGA automatic ball inspection
- > Bond pull
- > Die shear
- > Solder dip
- > Lead trim
- > Lead inspection and repair
- > Solderability restoration
- > Bake and dry pack
  - Demark and remark
  - Ball shear
  - Bond pull
  - Die shear

## 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, DDPK, 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
- > 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



4007 Commercial Center Drive  
Austin, Texas 78744  
tel: (512) 637-4500  
fax: (512) 637-4750

[criterialabs.com](http://criterialabs.com) > > >