Equipment Operating Procedures

Test Systems Manual

Automated Test Equipment (ATE) Overview

System Description: Our facility uses ABC V3400 series test systems for semiconductor device validation and characterization.

Common Equipment:

- ATE Test Heads (8 stations)
- Handlers (automatic part loading)
- Temperature control units
- Power supplies
- Oscilloscopes and analyzers

Standard Operating Procedure

Pre-Operation Checklist:

1. Verify system status indicator is GREEN
2. Check error log for overnight issues
3. Confirm temperature stabilization (±0.5°C)
4. Load correct test program
5. Verify part number matches work order
6. Run system self-test (5-minute cycle)

Operation Steps:

1. Load device into handler input tray
2. Select test program from menu
3. Enter lot number and operator ID
4. Press START button
5. Monitor first 5 units for anomalies
6. System runs automatically - 200 units/hour throughput

Post-Operation:

1. Collect completed parts from output tray
2. Review test data summary
3. Record yield percentage
4. Place passing parts in approved bins

5. Segregate failing parts for failure analysis

6. Clean work area and tools

Troubleshooting Guide

Error Code Reference:

E-47: Temperature Out of Range

- **Cause:** Thermal control unit malfunction or poor contact

- **Solution:**

    1. Check temperature display - should be 25°C ± 0.5°C

    2. Verify cooling water flow indicator

    3. Inspect device socket for debris

    4. If issue persists, contact maintenance (x-4500)

    5. Log incident in system

E-23: Communication Timeout

- **Cause:** Network connection lost or software crash

- **Solution:**

    1. Check network cable connection

    2. Restart test software (do not restart hardware)

    3. Reload test program

    4. If recurring, submit IT ticket

E-12: Handler Jam

- **Cause:** Part misalignment or mechanical obstruction

- **Solution:**

    1. Press EMERGENCY STOP

    2. Open handler door carefully

    3. Remove jammed parts

    4. Inspect for damaged parts in mechanism

    5. Clear jam location

    6. Close door and press RESET

    7. Resume operation

System Performance Issues:

Slow Test Times:

- Check for background processes consuming resources
- Verify test program optimization
- Review recent software updates
- Consider system maintenance schedule

Inconsistent Results:

- Calibrate test system (monthly requirement)
- Verify probe card condition
- Check power supply voltage stability
- Review environmental conditions (temperature, humidity)

Maintenance Schedule

Daily:

- Clean device socket and contact area
- Check error logs
- Verify calibration status

Weekly:

- Run diagnostic test suite
- Backup test data
- Clean filters and fans

Monthly:

- Full system calibration
- Update test program library
- Review maintenance logs with supervisor

Quarterly:

- Scheduled preventive maintenance by certified technician
- Performance qualification testing
- Hardware inspection

Quality and Data Management

Test Data Recording:

- All test results automatically logged to database
- Manual entry requires supervisor approval
- Data retention: 7 years per regulatory requirements

Yield Reporting:

- Calculate daily yield percentage
- Report yields below 95% to quality engineering
- Track trends for process improvement

Failure Analysis:

- Tag failing units with failure code
- Submit to FA lab within 24 hours for critical failures
- Document failure symptoms in system