



**Quality Requirements for ADTRAN  
Hardware Repair Service Suppliers**



## Foreword

ADTRAN designs and manufactures telecommunications equipment that has an enviable reputation for high reliability and quality content--a reputation that will be maintained and enhanced. This reputation is due to equipment design, production standards, and commitment by all management and operating personnel to the quality concept.

The elements contained in this document are those employed by ADTRAN to achieve its business objectives, which are best described as good commercial quality practice and are fundamental to any form of management or quality control. This document shall serve as a requirement specification and as a general guide to the extent of supplier quality control.

ADTRAN will assist the supplier in any reasonable manner to establish an understanding of and compliance with its contract, SLA and purchase order requirements. The supplier is cautioned that no departure from any specification is permitted without written approval from ADTRAN. Clarification of this or any other ADTRAN document affecting adherence or compliance may be obtained through the ADTRAN Hardware Repair Services Department.

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## Reference

- IPC-J-STD-033 Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices
- IPC-A-610E-2010 Acceptability of Electronic Assemblies
- IPC-7711B/7721B Rework, Modification and Repair of Electronic Assemblies
- IPC/EIA/JEDEC J-STD-002. Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires
- Industry Standard Code 39 Barcode Labels and Printing
- ANSI/ISO/ASQ Q9001-2008: Quality Management Systems Requirements
- TL 9000 Quality Management System (QMS) Requirements
- IPC-A620 Requirements and Acceptance for Cable and Wire Harness Assemblies
- ANSI/ESD S20.20-ESD Program
- Q-50 ADTRAN Workmanship Standard
- GRS06.1, Hardware Services 3rd Party Scrap Process
- GRS11.1, Packout Requirements for Repair Centers
- GRS12.1, Packing Slip Requirements for BBA Repair Centers
- ISO 2859 – International Standards: Sampling Procedures
- ISO 14001 Environmental management systems – Requirements
- ISO 18001 Occupational Health and Safety Management System
- ISO 26000 Guidance on Social Responsibility

## Definitions

- COD – Certificate of Destruction
- CUR – Customer Unrepairable
- EDI – Electronic Data Interchange
- EOL – End of Life
- FTP – File Transfer Protocol
- HQ – High quality
- HWS – Hardware Services
- PO – Purchase Order
- Ref Des – Reference Designators
- RMA - Return Material Authorization
- SFCS – Shop Floor Control System
- SLA – Service level agreement
- WIP – Work in Process



## **1.0 GENERAL**

### **1.1 Intent**

The intent of this document is best defined as GOOD COMMERCIAL PRACTICE. When viewed in this context, the requirements herein can be readily and economically satisfied by competent commercial suppliers.

### **1.2 Applicability**

When specified in the contract, SLA and or Purchase Order (PO), the requirements contained in this document shall be adhered to by the supplier. In the event a supplier desires an exception to the requirements contained herein, a request in writing delineating the exception shall be submitted to ADTRAN for approval prior to acceptance of the contract, SLA or PO. If a conflict exists between the provisions of this document and those of the contract, SLA or purchase order, the contract, SLA or PO shall take precedence.

### **1.3 Supplier Qualification**

ADTRAN utilizes capability surveys, product evaluation, compliance of procured material, and the promptness and effectiveness of corrective action taken to determine qualified suppliers. Continued qualification will be contingent upon continued quality of performance and the satisfactory results of periodic audits. Supplier ratings, based on the aforementioned elements, will provide comparative measures for determination of ADTRAN service providers.

### **1.4 ADTRAN Surveys, Supplier Capability Assessment**

Supplier facilities and operations may be surveyed and evaluated before and/or after the procurement of a product or service. The supplier's ability to meet ADTRAN requirements and to supply a product of consistent quality will be evaluated continuously. It is likely that unannounced audits will be conducted periodically to ensure compliance.

## **2.0 ADTRAN REPAIR CENTER REQUIREMENTS**

This section establishes quality and reliability requirements applicable to Hardware Repair Service centers (HWRS). It contains "General Requirements" which are applicable unless expressly excluded in the contract, SLA, Purchase Order or ADTRAN deviation request.

### **2.1 Inspection Requirements: Incoming and Final**

Unless otherwise instructed by ADTRAN the supplier shall use the workmanship guidelines listed in the Reference section of this document. In the event of modifications and or changes in criteria, ADTRAN will provide the supplier with clear instructions regarding the changes. The supplier shall have a process to control and implement special instructions issued by ADTRAN;

#### **2.1.1 Incoming Inspection**

The supplier shall establish a process to inspect units for Environmental damage or physical damage per ADTRAN supplied



guidelines upon receipt of the unit. The supplier shall establish a method to capture the incoming quality of the product prior to any cleaning or upgrade operation. The supplier shall have the ability to provide high quality (HQ) digital images of any nonconformance found. Product quality shall be tracked by RMA number, item number and serial number at a minimum.

1. The supplier shall track inspection results i.e. Pass/Fail by customer unless otherwise stated by ADTRAN management. Failed units shall be identified and reported to ADTRAN via the electronic means.
2. The supplier shall establish methods that enable flexibility to route the units through Attempt-to-Repair (ATR) loop, Scrap, Failure Analysis and or Form-Fit-Function tests on units found to have failed the incoming inspection. This requirement may be limited by Customer, Item Part Number or Serial Number, etc. These units shall be tracked throughout the repair process and special reporting may be required. ADTRAN will notify the repair center of such requirements.

**2.1.2 Final Inspection**

The supplier shall conduct a final inspection of all outbound units to ensure workmanship, all applicable tests, labeling and packaging requirements have been met. The supplier shall incorporate process controls so that the final pack out label will not print out if the all the applicable test(s) or process steps have not been satisfied. The supplier shall track and measure audit results continuously. ADTRAN may request periodic quality performance reports.

**2.2 Process Tracking and Control**

The supplier shall establish documented procedures or methods defining all steps of the repair process. The supplier should have a shop floor control (SFC) system to control and manage the flow of products through the facility. The SFC system must be able to track products at a minimum by:

• ADTRAN Part Number	• Serial number
• Receipt date	• Incoming Inspection pass/fail
• RMA number	• Customer Code
• Repair date	• Materials replaced and Ref Des
• Repeat receipts by serial number	• Date of test(s) and results WIP status

**2.2.1 SFC System**

The SFC system shall be able to track products through the complete process via operations, process steps and or work centers (i.e. Receiving, incoming inspection, test, repair, final inspection, shipping,



etc.). All shipments must be assigned a tracking number and all shipment information shall be maintained.

Note: ADTRAN highly recommends the supplier establishes a fail-safe, bar coded SFC tracking systems.

### **2.2.2 Performance Data**

The supplier shall have the ability to extract performance data, WIP status and daily reports from the SFC system that accurately depicts the status of ADTRAN units at any time.

## **2.3 Product Repair Requirements**

The supplier shall establish a product repair process that conforms to ADTRAN product specifications, and this procedure. (See References section for a list of required and recommended industry specifications.).

### **2.3.1 Approved Vendor List (AVL) Materials**

All repair materials used on ADTRAN products shall be listed on ADTRAN AVL. The Supplier shall track all materials used on all repaired units.

### **2.3.2 Deviations to Specifications**

A request for deviation to a drawing, bill of material (BOM), or specification shall be submitted and approved in writing or email by ADTRAN prior to the repair operation. Once approved, the deviation shall be clearly documented retained with the product documentation.

### **2.3.3 Introduction of Repair Products**

When a new product is introduced the supplier should have a process to make sure the documentation, test application, tooling, fixtures, materials and training is in place prior to repairing ADTRAN products. ADTRAN highly recommend that the supplier perform an inspection of one or more of the products to verify the repair meets ADTRAN specifications.

### **2.3.4 Failure Analysis (FA)**

ADTRAN may require an in-depth analysis of RMA units by request. These requests may require increased care and attention to fail mode, visible evidence, test step failure, etc.

1. The supplier shall establish a process to identify and track FA units. Special reports may be required per ADTRAN request

### **2.3.5 Lessons Learned**

The supplier shall maintain a "lessons learned" data base associating failed test step to actual repair to aid in minimizing troubleshooting time of defective assemblies and training of new technicians. ADTRAN may request this data on a periodic basis.

## **2.4 Labeling and Identification**

All outer and intermediate cartons or packages shall be clearly marked per ADTRAN packaging and labeling requirement guidelines. Item(s) received without proper identification shall be reported to ADTRAN.



## **2.5 Engineering Change Orders (ECO)**

ADTRAN will provide copies of all Engineering Change Orders as released. A copy of the ECO and an ECO acknowledgement form will be provided via fax, email or FTP to the supplier.

### **2.5.1 ECO Acknowledgement**

The supplier shall complete the ECO acknowledgement form and return to the email address [PCNOFFICE@ADTRAN.COM](mailto:PCNOFFICE@ADTRAN.COM) within the time specified with all requested information

## **2.6 Reporting and Communication**

The supplier shall establish a communications plan that details the deliverables required by ADTRAN on a periodic and as needed basis. The communications plan will contain the proper escalation path for issues, problems or delays as well as key points of contact. The supplier must review and maintain the communication plan on a periodic basis

### **2.6.1 Daily Production Report**

The supplier shall provide a daily report that shows a status of units at the repair facility.

The report shall show the daily shipments and receipts and incoming inspection results, Turn Around Time (TAT) status and daily production at a minimum. All graphs shall have supporting data from SFC system. Refer to **Appendix A** for example of the preferred Daily summary report format.

### **2.6.2 Action Item Register**

If required the supplier shall establish an 'action item register. This report will be used to track ongoing action items and special projects as needed.

### **2.6.3 Weekly meeting/conference calls**

The supplier shall have dedicated account managers available to chair weekly quality/production team meetings per ADTRAN request.

### **2.6.4 Electronic Data Interchange (EDI)**

The supplier shall have the ability to implement, manage and maintain automated EDI feeds per ADTRAN request.

## **2.7 Deviations and Substitutions**

ADTRAN expects the supplier to comply with the requirements of the contract, SLA or purchase order. No deviations and/or substitutions in material, design, specifications, or operating performance are permissible unless approved in writing by ADTRAN. Such changes are permissible for single lots via ADTRAN Waiver or Deviation process.

### **2.7.1 Operational Change Notification**

The supplier shall notify ADTRAN when significant process changes are made to operations. Examples of major process changes include a new technique, materials or a change in subcontracted –suppliers.



ADTRAN shall be notified prior to the change being made.

1. A critical examination shall be made of the first unit(s) processed after the change is implemented.
2. The notification shall identify the type of change, date of change, and impact to ADTRAN. Notification to ADTRAN shall be in written electronic form and sent to ADTRAN for approval.

## **2.8 Spares Management**

ADTRAN may require the supplier to manage strategic stock of refurbished or finished goods units at the supplier's facility. When required:

### **2.8.1 Spares Inventory**

The supplier shall have the capability to manage this inventory by item part number, serial number and revision.

### **2.8.2 Spares Inventory Status**

The supplier shall report inventory status as well as inbound and outbound transactions to ADTRAN.

## **2.9 Shipments and Packaging List**

Suppliers must have documented methods or procedures to track all inbound and outbound shipments. All outbound shipments shall be tracked and have a packing list per ADTRAN packing list requirement guidelines.

## **2.10 Nonconforming Material**

The supplier shall have a documented procedure or method to control and communicate any non-conforming materials to ADTRAN.

### **2.10.1 Scrap**

The supplier shall establish a documented process to scrap units per ADTRAN requirement guidelines.

1. The supplier shall be able to control, identify and segregate units deemed as scrap.
2. The supplier request and receive approval for all units to be scrapped.
3. The supplier shall use an ADTRAN approved local provider to dispose of the scrap units appropriately.
4. All units scrapped locally shall be documented in a Certificate of Destruction (COD).

## **2.11 ADTRAN Supplier Corrective Action Requirements**

When it has been determined that corrective action is required from a supplier, an External Supplier Corrective Action Request (ECAR) will be submitted to the responsible supplier.

### **2.11.1 Supplier ECAR Actions**

1. The supplier shall use the (1-5-10 Rule) for addressing an ECAR. (See Note 4 for exception).
  - i. "1" business day from the receipt of the ECAR to provide acknowledgement of receipt and immediate action plan.
  - ii. "5" business days from the receipt of the ECAR to provide interim corrective actions for correcting the nonconformance.





- iii. "10" business days for submitting a final root cause and corrective action plan.

**Note:** Based on severity of issue, response times may change depending on customer impact.

2. The final corrective action response shall include the following information.
  - i. The containment actions taken with date of implementation
  - ii. A description of the root cause
  - iii. The proposed corrective action or solution to the problem
  - iv. The actual or planned implementation date of the corrective action(s)
  - v. The plans for verifying that the corrective action was effective, and
  - vi. The effectiveness or validation date
3. Inadequate and/or untimely responses to ECAR will result in additional actions on the behalf of ADTRAN. Actions may include demerits to supplier performance rating, probation, and disqualification.
4. All corrective action results must be made available at internal management reviews and available to the customer upon request.

### **3.0 SUPPLIER ENVIRONMENTAL & HEALTH AND SAFETY MANAGEMENT SYSTEM**

ADTRAN suppliers should have an established-documented and maintained Environmental Management System (EMS). In addition to having an established EMS the supplier should have an established Corporate Social Responsibility (CSR) Program. The EMS and CSR program should comply with the requirements of an accredited standard such as:

- ISO 14001 Environmental management systems – Requirements
- ISO 18001 Occupational Health and Safety Management System
- ISO 26000 Guidance on Social Responsibility

ADTRAN is an ISO 14001 company, and has established a CSR program that focused on the "Sustainability" aspects of an environmental and sociability system. ADTRAN Environmental Policy and Sustainability commitment may be viewed at: [ADTRAN Company Web site - Environmental Policy-Sustainability](#).

#### **3.1 Environmental, Health, and Safety (EH&S) Certifications**

The supplier shall provide ADTRAN copies of its EH&S system registered certifications. At a minimum the latest version of the supplier certificates shall be provided when an update or release of the certificate is made.

### **4.0 SUPPLIER QUALITY MANAGEMENT SYSTEM**

ADTRAN suppliers should have an established-documented and maintained quality management system (QMS). It is recommended the QMS complies with the requirements of an accredited quality system (i.e., ANSI, ISO, ASQ, TL, and Q9001 Quality Management Systems Requirements).



ADTRAN has established business element requirements for ensuring that purchased items and supplier processes conform to the specification requirements.

**Note:** Some business elements may not be applicable to a supplier; for example “Moisture Sensitive Devices/materials” may not be applicable to a metal supplier.

#### **4.1** Quality System and Management Responsibility.

- The supplier shall have a documented quality system procedure to ensure product conformance. The management shall also review the quality system at defined intervals and maintain records of these reviews.
- The supplier shall establish and maintain documented procedures for planning and implementing internal quality audits to verify quality activities and the effectiveness of the quality system. The internal audit shall be done at prescribed interval with results report at the management review.
- Resources for the implementation of a Quality Management System will be required from the supplier.
- Internal Quality audits must be formally planned, performed at pre-specified intervals and communicated to management during management reviews. The supplier must also perform formal procedure reviews at a pre-determined frequency to ensure that the documentation is current and relevant.

#### **4.2** Document and Data Control

- The supplier shall establish and maintain a documented procedure to control all documents related to the requirements of the supplier’s quality system. The procedure shall not only address the control of the supplier’s documents, but also the control of customer supplied documents.
- Pertinent and current issues of appropriate documents shall be available at the locations where the operations that impact quality are being performed.

#### **4.3** Change Management

- The supplier shall establish and maintain a formal documented procedure to control elements related to the requirements of a formal change control system. The procedure shall not only address the control of the supplier’s documents, but also the control of customer supplied documents (such as drawings, Industry Specification, etc.). The procedure shall describe the review, approval, release, distribution and revision of change documents in a timely and controlled manner.
- Records of the changes and the results of the review of changes including any necessary actions shall be maintained.
- The supplier must have an internal process capable of transmitting applicable change (ECO) requirements to all team members and update all applicable processes and procedures in an effective and timely manner.

#### **4.4** Supply Chain Management (Purchasing)



- The supplier shall ensure the adequacy of specified purchase requirements prior to communicating with the supplier. The documented purchasing procedure shall include product requirement definition.
- The supplier shall establish and implement the inspection or other activities necessary for ensuring that purchased product meets specified purchase requirements.
- The supplier shall establish criteria for selecting suppliers including the quality system and specified quality assurance requirements.
- The supplier must be able to demonstrate an effective Purchase Order (PO)/material requirement process.
- The supplier shall have a process to handle ADTRAN material Purge notifications.

#### **4.5** Receiving (Raw materials and Field Units)

- The supplier will ensure that incoming material conforms to specified requirements prior to its usage. If incoming inspection is not required, the supplier must demonstrate adequate controls and justification in place to ensure that the qualities of the material received are acceptable.
- The supplier shall ensure that field returned units are verified to ADTRAN requirements (i.e., verify field unit serial number is authorized for processing, etc.).
- The supplier shall establish and maintain a specific area that clearly segregates incoming material from material already received.

#### **4.6** Production Planning

- The supplier shall establish and maintain a forecasting procedure that is capable of handling the requirements placed by ADTRAN. This procedure shall define the prescribed interval to update the accuracy of the forecast.
- The supplier shall have a process for capacity planning.
- The supplier must have an effective process to handle fluctuations in demand.

#### **4.7** Inventory Management & Material Safety Data (MSD)

- The supplier should have a documented inventory management process.
- The supplier shall establish an inventory monitoring and management system in order to track all materials and assemblies on hand.
- The supplier shall establish a documented program as to how its handle MSD materials in accordance with the JEDEC requirements (J-STD-033).
- The supplier shall have procedures and facilities for opening, inspecting, sealing and storing packages containing MSDs in accordance with JEDEC requirements.

#### **4.8** Process Control

- The supplier shall establish documented procedures defining all repair operations.



- The supplier shall develop a planned preventive maintenance system requiring procedures, predicative maintenance and replacement schedules.
- In case of components or materials that are MSD or Electrostatic Sensitive Devices (ESD), procedures must clearly indicate the process for handling, storage, packaging, transportation and review of these materials.

#### **4.9** Corrective Action and Non-Conforming Processes

- The supplier shall establish and document a system to control product that does not conform to specified requirements and ensure that the problem is contained, root cause is determined and preventive measures are established. The system should provide for identification, evaluation, and disposition of non-conforming product.
- Adequate facilities should be provided to analyze the root cause of non-conforming product. The throughput period should be agreed upon with the customer – normally two weeks. For products that have failed external to the supplier's manufacturing facility.

#### **4.10** Process Improvement Program.

- The supplier shall establish and maintain a documented Quality Improvement Program to improve the quality and reliability of the processes/product. The program shall be active and contain a prioritized list of scheduled quality/reliability issues being addressed.

#### **4.11** Inspection and Testing

- Test plans shall be documented (including a flow diagram for all inspection points) and all results must be recorded. The test plan should also include acceptance criteria for the tests and inspections.
- Inspection and testing results shall be recorded and analyzed using control charts or a similar technique as appropriate for the purpose of identifying problem areas and monitoring the effectiveness of the quality system.
- Repair or rework product shall be inspected in accordance with the defined quality plan. Repair and return products shall also be subjected to the appropriate test(s) to ensure conformance to product specification.
- Records shall be maintained to provide evidence that the inspection and testing have been completed. All inspection or testing activity shall have detailed documentation, status identification and be available for inspection personnel.
- Product should not be shipped until all inspecting and testing activities have been completed and verified as conforming to specific requirements. ADTRAN requires an out of box audit of product using an approved sampling plan per ISO 2859 – International Standards: "Sampling Procedures". All products must have a documented test plan.

#### **4.12** Inspection, Measuring and Test Equipment.

- Supplier shall maintain current inventory of all customer supplied tooling, test and measurement equipment by control number, serial number and date received.
- Supplier shall maintain an equipment calibration program



- All applicable equipment in the calibration program shall be clearly identified with necessary information to enable calibration, traceability and status.
- Any equipment out of calibration shall be identified and removed from the production environment. The supplier shall have a procedure to address active equipment found to be out of calibration.
- Any contracted calibration services or labs shall be accredited to the appropriate national or international standards within the industry.
- The Supplier shall have a defined and effective Preventive Maintenance program that addresses all production and non-production related services and equipment that could impact the product received by ADTRAN.
- Suppliers must notify ADTRAN of concerns, limitations or capacity constraints in detail that is effecting, preventing or discontinuing a quality product or service.

#### **4.13** Field Quality and Customer COMPLAINTS Return

- The supplier shall have the capability to track field turnaround time or repeat returns by serial number and customer. ADTRAN will establish scrap guidelines for repeat returns.
- The supplier must have the capability to conduct an in depth Failure analysis upon request.
- For cases that have been confirmed as a quality issue, a formal corrective action process should be applied to each complaint/return. Supplier will notify ADTRAN of the result of the Failure Mode Analysis (FMA) and corrective action plan.
- Customer returns and complaints must be recorded.
- Supplier shall monitor and report trends to ADTRAN Quality engineering at [GRS.Quality.Engineering@adtran.com](mailto:GRS.Quality.Engineering@adtran.com).

#### **4.14** Customer Support and Satisfaction

- Suppliers must have a documented procedure for Customer Support. The procedure must have well-defined escalation path and tracks response times.
- The Customer Satisfaction process must define clearly the interface with the Management Review process.

#### **4.15** Disaster Planning and Security

- The supplier shall ensure that copies of Quality records / data / software are stored either off-site or within fireproof storage on-site. Supplier must also ensure that disaster recovery and contingency plans are documented and available for review by ADTRAN.
- Emergency action plans that are approved, tested and reviewed for (fire, flood, hurricane, tornado, terrorist, etc.) must be clearly defined and in place.
- The supplier shall assure that adequate security protocols (i.e., security guards, card-access, photo identification, visitor's badges, etc.) are in place for all buildings/facilities.

#### **4.16 Environmental Health and Safety (EH&S)**

- The supplier should have an effective system in place for assuring compliance to applicable (supplier and customer) legal requirements.
- The facility should have a management process, with clearly defined roles and responsibilities for managing Environmental, Health and Safety issues.
- ADTRAN customer contracts may require or encourage suppliers to establish environmental management systems, preferably certified by an accredited external registrar.
- The facility should have established health and safety programs to ensure the well-being of personnel and property.

##### **4.16.1 Corporate Social Responsibility (CSR)**

- The supplier should have agreed on a program, and communicated an explicit commitment to CSR.
- The supplier should have a common definition of CSR as it relates to their company, their sector and broader societal trends.
- The supplier should conduct regularly review progress on the company's performance against CSR goals, objectives and targets.

#### **4.17 Training (Human Resources)**

- The supplier shall establish and maintain a documented procedure for identifying and training all personnel (including temporary personnel) performing activities affecting quality.
- Appropriate records of training shall be maintained for all employees performing activities affecting quality, and will include an employee training plan, training status, continuous improvement training, re-certification status (as applicable), problem solving training and customer satisfaction training.
- The supplier shall determine the personnel resources and capabilities required, prior to accepting a customer's order or committing to a customer delivery. The supplier shall provide adequate and capable personnel resources for management, performance of work, and verification activities to satisfy order requirements.
- The supplier must have a policy that requires a background check on employees, contractors or interns.

#### **4.18 Order Management and Logistics**

- The supplier shall have an effective process for tracking inbound and outbound shipments as well as in house inventory of units and material required to perform repairs.
- The supplier shall establish an effective process for notifying the customer of missed commitments. The notification shall include a recovery plan.
- The supplier shall establish an effective process for notifying the customer of material requirements.



- The supplier shall establish a process to provide a timely response to changes in priority or expedited delivery requests. Response should include impact to regular production schedule.
- If applicable, the Supplier shall establish documented procedures for making international shipments.

**4.19** Project Management

- The supplier shall establish a process that effectively introduces new products to the process. The process must be formalized and should establish clear guidelines on
  - Product pricing,
  - Materials requirements
  - Testing requirements
  - Training requirements
  - Production ramp timeline.

**REVISION HISTORY**

<b>Revision</b>	<b>Author</b>	<b>Date</b>	<b>Description</b>
A	A. Guerrero & G. Giles	9/28/15	New

## Appendix A

