

QUALITY PROGRAM
REQUIREMENTS FOR
ADTRAN 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 purchase order requirements. The supplier is cautioned that no departure from any specification is permitted without a purchase order change. Clarification of this or any other ADTRAN document affecting purchase order compliance may be obtained through the ADTRAN Purchasing Department.

Grady Broadnax, signature on file
Grady Broadnax / Director, Procurement

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QUALITY PROGRAM REQUIREMENTS FOR ADTRAN SUPPLIERS

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 or purchase order, 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 delineating the exception shall be submitted for ADTRAN approval prior to acceptance of a Purchase Order (PO). If a conflict exists between the provisions of this document and those of the purchase order, the purchase order 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 procurement sources.

1.4 ADTRAN Surveys and 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. Audits will be periodically conducted to determine compliance with our purchase requirements and the requirements of this document.

2.0 REFERENCE

- IPC-J-STD-033 Standard for Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices
- 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-A610 Acceptability of Electronic Assemblies

- IP-CM-770 Guidelines for Printed. Board Component. Mounting
- ANSI/ESD S20.20-ESD Program
- Q-50 ADTRAN Workmanship Standard,

3.0 ADTRAN SUPPLIER REQUIREMENTS

This section establishes requirements applicable to items ordered under the Purchase Order, of which are of the required quality and reliability. It contains “General Requirements” which are applicable unless expressly excluded in the Purchase Order, and Special Quality Requirements (SQR) which apply as designated.

3.1 ADTRAN Source Inspection

ADTRAN may require onsite source inspection of material and products to ensure conformance with the contract and the specification requirements. Source Inspection neither guarantees final acceptance nor does it relieve the supplier of its responsibility to furnish an acceptable product.

When Source Inspection is specified the supplier shall notify ADTRAN within five (5) working days of final inspection or testing of the products to allow an ADTRAN Quality Assurance representative to be present to witness the inspection/test. Final acceptance of all material will be made upon receipt of the product at ADTRAN.

3.2 Inspection criteria

Unless otherwise agreed, the supplier shall use ADTRAN’s Workmanship Standard ‘Q50’ criteria for cosmetic workmanship requirements for fabricated materials/parts, plastics, labels, silk-screening, pad printing, assemblies and finished product.

3.3 First Article Inspection (FAI) Requirements

First Articles are required for all custom mechanical and cable items. Unless otherwise agreed, suppliers are to provide FAI reports prior to the initial receipt of production material.

3.3.1 Supplier Responsibilities

The supplier is responsible for meeting all requirements of the engineering specification, drawing and Purchase Order, along with providing:

- A completed ADTRAN First Article Inspection Report (form Q100-1) as provided in Appendix A shall accompany all First Articles. This report is to provide actual measurements in comparison to the specifications.
- A working print should be attached to the report that will correlate the ADTRAN First Article Inspection Report item number (LOC) to the dimension on the print. All dimensions are to be considered critical.

3.3.2 First Article Form (Appendix A)

The supplier shall complete the form (Appendix A) with the following information

Part No.	Complete ADTRAN Part Number
Rev.	Revision level of the part number being submitted
Sheet	Sheet 1 of the total pages submitted for part number
Part Name	Description of part

Supplier	Name of Manufacturer
Originator	Supplier's Inspector's name
PO No.	ADTRAN PO number
Quantity Received	Total quantity received
Inspected	Total quantity inspected
Submission	Mark if First Submission, Second Submission or Submission due to Rebuilt or Refurbished tooling
Certification of Compliance	Signature of supplier's Quality Manager

Note 1: Form Q100-1 is considered an ADTRAN Quality Record and shall not be modified by the supplier.

3.3.3 Mechanical Assemblies

Chassis or mechanical assemblies shall be submitted as individual parts with proper documentation prior to submission as an assembled product, or the individual parts shall be submitted when the assembled product is submitted (all with proper documentation).

- a. Characteristics that cannot be verified by visual inspection such as, plating, painting, etc., shall be certified by the supplier's completion of the Certificate of Compliance block on the ADTRAN First Article form. First Articles are not required on silk-screens and overlays.

3.3.4 Tool Changes

First Articles are required for all tooled endcaps. The FAI Report should accompany all samples submitted to ADTRAN for review and approval.

3.3.5 Packaging and Packaging Artwork

An 8.5" x 11" sample of the artwork to be used on ADTRAN packaging must be submitted for review and approval. The First Article Inspection Report, without the second page requesting dimensions, should accompany the sample. The document must confirm the color numbers that will be used for printing packaging.

3.3.6 Deviations to Specifications

A request for deviation to a drawing or specification must be submitted and approved in **writing** by ADTRAN prior to First Article submission. Once approved, the deviation must be clearly documented and attached to the ADTRAN First Article Inspection Report.

3.3.7 Review of First Article submissions

ADTRAN will provide in writing to the supplier approval of the First Article and/or provide direction on issues requiring correction. The supplier will be advised if additional First Articles are required.

- a. Unless otherwise delegated, Purchasing will notify the supplier of disposition of all First Articles submissions.

3.4 Deviations and Substitutions

ADTRAN expects the supplier to comply with the requirements of the purchase order. No deviations and/or substitutions in material, design, specifications, or operating performance are permissible unless documented by a purchase order change. Such changes are permissible for single lots if

approved by the ADTRAN Non-Conforming Material Report, Waiver or Deviation process.

3.4.1 Operational Change Notification

The supplier shall notify ADTRAN when significant process changes are made to operations used in the production of a product or material purchased by ADTRAN. Examples of major process changes include a new operator, new machine, new technique, materials, and a change in sub-suppliers.

- a. ADTRAN shall be notified prior to the change being made on any ADTRAN product.
- b. A critical examination shall be made of the first unit(s) processed after the change is implemented.
- c. Notification to ADTRAN may be in the form of a letter or email.
- d. The notification shall identify the type of change, date of change, and impact to ADTRAN.
- e. The notification shall be sent to the Purchasing Commodity Manger, the Purchasing Buyer and/or Supplier Quality Engineer.

3.4.1 Date Code Requirements

Batteries, epoxies and other perishable items are subject to manufacturer shelf life guidelines. The use of Aluminum Electrolytic capacitors and Printed Circuit Boards (PCBs) shall follow the below mentioned criteria:

- a. Electrical components should be no greater than 18 months old upon receipt at Incoming (Component) Inspection.
 - i. The 18 month clock begins on the date the component was manufactured and the Date Code is assigned.
 - ii. Components exceeding 18 months shall be subjected to special inspection and testing (solderabilty, etc). The type of inspection, test, and sampling plan shall be defined and agree upon by ADTRAN Supplier Quality Engineering.
- b. PCBs: all Printed Circuit Boards and all components to be mounted on such shall have permanent markings that meet EIA RS 327A method B except the solvents used will be IPA Alcohol, or water.
 - i. Hot Air Solder Leveling (HASL) \leq date code + 24 months (without solderabilty testing).
 - ii. Electro less Nickel Immersion Gold (ENIG) \leq date code + 18 months (without solderabilty testing).
 - iii. Immersion Silver (ImAg) \leq date code + 12 months (without solderabilty testing)
- c. Part Numbers (P/N): The complete Supplier P/N for surface mount devices may or may not be stamped on the part due to space limitations.
 - i. Any changes to the supplier's materials and/or processes shall be reported to ADTRAN Quality prior to use on any ADTRAN product.
- d. Aluminum Electrolytic (AE) capacitors received into inventory shall be used within 24th months of the manufacture assigned date code.

Note 2: Polymer Aluminum capacitors follow date code requirements for standard electrical components (Section 2.4.1.a).

3.4.1.1 Nonconforming Material

- i. All materials found to exceed the date code requirements shall be processed in accordance with ADTRAN and/or the suppliers' nonconforming processes.

3.4.1.2 Deviations

- i. Electronic components: A material deviation/wavier shall be issued for the purchase, receipt, and usage of printed circuit boards exceeding the date code specified in Section 2.4.1.a.
- ii. PCB: A material deviation/wavier shall be issued for the purchase, receipt, and usage of printed circuit boards exceeding the date code specified in Section 2.4.1.b.
- iii. AE Capacitors: A material deviation/wavier shall be issued to purchase or receive AE capacitors exceeding the 18th month - up to the 30th month of the manufacture date code. And to use AE capacitors between the 25th month - up to the 36th month of the manufacture date code.
 1. AE capacitors exceeding the date code shall be subjected to and must pass sample testing for leakage current, Equivalent Series Resistance (ESR) and solderability.
 2. Polymer Aluminum capacitors follow date code requirements for standard electrical components

3.5 Barcoding of Containers and Packing Slips

All outer and intermediate cartons or packages shall be marked with the following information by a label applied to each carton:

- Purchase Order,
- ADTRAN Part Number,
- Manufacturer's Part Number,
- Date Code, and Quantity

Note 3: 'Date Code and Quantity' are the minimum data fields that ADTRAN requires and should be barcoded using Industry Standard Code 39.

3.5.1 Data Display

- a. The above data shall be displayed in human readable text.
- b. All barcodes should be a minimum of 7.5 mils in density.
- c. Barcode should not be encoded with dots.
- d. The label may be in a vertical or horizontal format, whichever is appropriate with the supplier labeling operation.
- e. A Package Count Data field is requested in human readable text only in the form of "X of Y," where "X" is the sequential package number beginning with "1," "Y" is the total number of packages.
- f. Only single Date Coded parts should be included in containers.
- g. Print Quality shall meet ANSI Standard 3.182, which requires all symbols to meet or exceed grade C on a scale of "A" through "F."

3.5.2 Multiple Date Coded Parts

- a. For containers containing multiple Date Coded parts, labeling shall indicate all Date Codes of all parts enclosed.
- b. This can be accomplished with either a single label with all appropriate Date Codes listed, or multiple labels with the individual Date Codes.

- c. Containers with more than 2 different Date Coded parts are discouraged.

3.5.3 Packing Lists

- a. ADTRAN requests that all Packing Lists provided with shipments contain the following information in a barcode and human readable text. This information may be preprinted on the packing list or on a label and applied to the packing list, if applicable. All standards listed above will apply. The following information shall be listed including on the packing list:
 - ADTRAN P. O. Number
 - ADTRAN Part Number
 - Manufacturer's Part Number
 - Date Code
 - Quantity
 - Packing List Number
- b. Electrostatic protective packaging material shall be employed on all products delivered to ADTRAN that are sensitive to ESD.
- c. All semiconductor devices shall be packaged in material that is both anti-static and ESD shielding.
- d. White Styrofoam may be used for packaging if marked "ESD Safe". Colored Styrofoam (with anti-static properties) is acceptable.
- e. Shipping containers should not exceed a maximum of 35 pounds.
- f. Each container/tube should have a consistent number of parts except the final container/tube may have a quantity difference.
- g. Where the possibility of spoilage exists, items in storage shall be date stamped/coded, etc., and used on a First-in First-out basis.

3.6 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.

3.6.1 Supplier ECAR Actions

- a. The supplier shall use the (10 – 20 Rule) for addressing an ECAR. (See Note 4).
 - i. 10 business days from the receipt of the ECAR to provide immediate actions for correcting the nonconformance.
 - ii. 20 business days for submitting a final corrective action plan.

Note 4: Based on severity of issue, response time may change. For a customer impacting condition, the response time is 5 Business days.

- b. If final root cause can not be provided by the response due date, at a minimum the corrective action should be completed and submitted to Purchasing.
- c. The final corrective action response shall include the following information:
 - The initial actions taken to contain the problem
 - A description of the root cause of the problem
 - The proposed corrective action or solution to the problem
 - The actual or planned implementation date of the corrective action

- The plans for verifying that the corrective action was effective, and
- The actual or planned date of the verification of effectiveness
- d. 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.

4.0 SUPPLIER QUALITY MANAGEMENT SYSTEM

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

ADTRAN has established 25 business element requirements for procurement and for ensuring that purchased items and supplier processes conform to the product/material drawing, specification, and procurement requirements.

Note 5: Some business elements may not be applicable to a supplier; for example Section 3.10 “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 Development and Design

- The supplier should establish and maintain a documented product development procedure to control the design process from the initial product conception to the final product release. This procedure should include a flow chart overview of the design cycle, and the design review documentation templates.
- For each individual design project, a milestone plan detailing the development phases and their duration and design review dates should be created and agreed with the customer. Any modifications to this plan after the initial release must have the customer’s approval.
- The initial design phase should include detailed customer specifications, including all applicable standards (those defined by the customer and those which are considered mandatory for the product given its intended use – CE, Network Equipment Building System (NEBS), etc) and target costs. Both the

supplier design manager and the customer representative should sign off. These specifications should be available to all members of the design team.

4.3 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.
- The supplier shall maintain a master list, identifying the current revision status of all controlled documents.
- Pertinent and current issues of appropriate documents shall be available at the locations where the operations that impact quality are being performed.
- The supplier shall establish and maintain a documented procedure for the identification, collection, indexing, access, filing, storage, maintenance, and disposal of quality records.

4.4 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, KS Specifications, etc.). The procedure shall describe the review, approval, release, distribution and revision of change documents in a timely and controlled manner.
- Engineering Change Orders (ECO) whether design / procedural, issued on a temporary or permanent basis must be adequately controlled and communicated to all affected organizations.
- 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 from a customer to all downstream suppliers in an effective and timely manner.

4.5 Supply Chain Man agent (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 shall have a documented procedure for generating purchase orders. Purchasing information shall describe the product to be purchased, including the appropriate requirements needed for approval of product. Suppliers must also

ensure compliance to special instructions that are requested by ADTRAN and be capable of flowing down ADTRAN requirements to second tier Suppliers.

- The supplier must be able to demonstrate an effective Purchase Order (PO)/material requirement process.
- The supplier must have a defined process on escalating delivery requirements with their downstream suppliers. The process must define the appropriate times to escalate and establish the steps involved.

4.6 Supplier Management

- The supplier shall establish and maintain a formal documented process to qualify vendors. This procedure shall define the criteria for the qualification/disqualification of a vendor.
- The supplier shall have a documented procedure to evaluate risk analysis and maintain the ability to communicate to management the risk within the supply chain.
- The supplier shall have a documented process for corrective action that provides feedback to suppliers on all quality and performance issues.

4.7 Receiving

- The supplier shall have a documented procedure to 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 establish and maintain a specific area that clearly segregates incoming material from material already received.
- The supplier shall ensure that there is a documented process to accurately label crates, boxes, shipping containers, etc.
- The supplier must establish a process that tracks the recall and replacement of non-conforming material that is in current production.

4.8 Demand and Production Planning

- The supplier shall establish and maintain a forecasting procedure that is capable of handling the requirements place by ADTRAN. This procedure shall define the prescribed interval to update the accuracy of the forecast.
- The supplier shall have a Material Requirements Planning (MRP) system. The MRP system shall have the ability to feed into the purchasing of materials, synchronize demand and supply.
- The supplier must have a procedure to track delivery performance on a weekly basis and maintain a feedback system on performance for its customers.
- The supplier shall have a process for capacity planning.
- The supplier must have an effective process that handles material shortages and helps prioritize and expedite a recovery effort to bring back production up to speed.

4.9 Inventory Management

- The supplier should have a documented inventory management process that addresses access control of the warehouse, the provisioning of materials that are impacted by engineering change, and excess/obsolete inventory review process.
- The supplier shall establish an inventory monitoring and management system. Whenever appropriate, the inventory items should be categorized based on their value and/or lead-time. The inventory items should be properly identified with their part number.
- Supplier should establish a mechanism to monitor the materials in their supply chain. In case of materials shortage, a proper escalation process should be in place to resolve the key shortage issue including a notification to ADTRAN. In case of materials shortage, a proper escalation process should be in place to resolve the key shortage issue including notification to ADTRAN.

4.10 Moisture Sensitive Devices/materials (MSD)

- 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.
- Some method of dry storage facilities (dry nitrogen, dry air, and desiccant) shall be available as required in the component storage area, manufacturing assembly areas, and repair areas.

4.11 Process Control

- The Supplier shall establish documented procedures defining all manufacturing steps for a product.
- A formal sign-off process is required prior to placing new equipment into manufacturing operations. Records for all process change and equipment must be maintained.
- The suppliers shall establish and maintain a documented procedure to promptly advise the customer prior to transferring work to another location than that described in the quality plan or otherwise initially agreed to with the customer.
- 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 ESD (Electrostatic Sensitive Devices), procedures must clearly indicate the process for handling, storage, packaging, transportation and review of these materials.
- Traceability for all materials must be clearly identified. This requirement includes all raw material, work-in-progress (WIP) and finished goods. The processes should be established in accordance with Industry procedures such as IPC-A610, IP-CM-770, and ANSI 20.20.
- Production materials that are build up as a kit for an aggregate assembly must be tracked and controlled to ensure accuracy and completeness prior to issuance to

the production floor. Verification of the work instructions, identification and part shortage issues for kits must be clearly defined.

- All points to be soldered (terminal, leads, stranded wire, etc.) shall meet the solderability requirements defined in IPC ANSI / J-STD-002 - 4.2 and 4.3.

4.12 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.
- A full failure mode analysis (FMA) must be carried out. The quality organization must be responsible for determining the failure mode, the root cause analysis and the corrective/preventive actions taken to prevent a reoccurrence. Subsequent to this, a detailed failure analysis report should be issued to the customer for each failure mode.
- All corrective action results must be made available at internal management reviews and available to the customer upon request.
- The supplier shall establish a documented return material authorization (RMA) process for customer returned material.

4.13 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.

4.14 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.

4.15 Inspection, Measuring and Test Equipment.

- The supplier shall establish processes to ensure that the measurement and test equipment is acceptable for use, maintained to suitable accuracy and protected from damage and deterioration during handling and storage.
- All applicable equipment in the calibration program shall be clearly identified with necessary information to enable calibration, traceability and status.
- Measurement and test equipment shall be verified at specified intervals, or prior to use, against measurement standards traceable to international or national measurement standards.
- Any out of calibration measurement or test equipment shall be documented and the status shall be clearly identified. 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.

4.16 Field Quality and Customer Returns

- Supplier shall establish a documented procedure to address the return and repair process. This procedure should include the movement (steps taken) of material through all operations.
- The supplier shall have the capability to track field turnaround time.
- Failure analysis should be conducted for each ADTRAN complaint and a documented FMA process must be available.
- For no trouble found (NTF) cases, ADTRAN should be notified in an appropriate manner. For cases that have been confirmed as a quality issue, a formal corrective action process should be applied to each complaint/return, and ADTRAN should be notified of the result of the FMA and corrective action plan.
- Customer returns and complaints must be recorded, and proper statistic techniques should be applied to monitor ADTRAN’s return rate.

4.17 Customer Support and Satisfaction

- Suppliers must have a documented procedure for Customer Support. The procedure must include elements or sections that describe technical support, points of contact, dedicated account managers (where applicable),

forms/duration of support, geographical region of support (where applicable) and a customer complaint system.

- An effective Customer Satisfaction process must be in place with well-defined metrics that quantifies customer satisfaction surveys and customer complaint response times. Suppliers must have a formal and effective customer complaint system.
- The Customer Satisfaction process must define clearly the interface with the Management Review process. Metrics such as number of complaints, response times and survey results must also be used to communicate the effectiveness of the customer satisfaction process at the Management Review.

4.18 Reliability Program

- Supplier must establish and maintain a design reliability program to predict and measure the reliability of new or modified products. As necessary the program must include the review of software reliability and reliability testing on work in process to ensure compliance. The program must also ensure that if the results do not meet ADTRAN expectations, corrective actions must be implemented. As part of this program, the product's life cycle should be determined with both the early life, mean time between failure (MTBF) and steady state failure rates defined.
- The supplier must ensure that all sub-components meet the reliability requirements specified for the products intended use. There should be documented criteria regarding the selection process for commercial, industrial and military grade components.
- The design change procedure shall specify the reliability levels required for the individual products. The reliability should be re-assessed, if ADTRAN or the supplier reliability manager deems it necessary, when Engineering Change Orders (ECO) is introduced.

4.19 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.
- Quality records shall be maintained to demonstrate conformance to specified requirements (reference throughout the quality elements where a "Record" is required).
- Emergency action plans that are approved, tested and reviewed for (fire, flood, hurricane, tornado, terrorist, etc.) must be clearly defined and in place.
- Security policies governing an employee/non-employee's access to buildings/facilities shall be clearly defined and enforced.
- 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.

- Procedures shall be in place to notify Customs authorities if the supplier notes anomalies in shipments or illegal imports.
- The supplier shall ensure that policies are in place to control the following Information Technology (IT) applications: Firewall access, encryption, phone and voicemail, e-mail and virus protection. IT servers shall be backed up regularly and overall IT disaster contingency and recovery plans shall be well defined.

4.20 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.

4.21 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.

4.22 ESD Sensitive Materials

- Ownership of the ESD process is essential and reflects on the level of management commitment. It is imperative that all employees who come in direct contact with ESD sensitive components undergo formal ESD training and re-training in order to raise ESD awareness.
- The supplier shall establish and maintain a formal documented ESD program. ESD audits at a pre-determined frequency should be performed to ensure compliance to the program. External ESD audits must be performed where necessary to ensure supplier compliance.

4.23 Order Management and Logistics

- In terms of the supply base, delivery performance must be available for feedback on supplier performance. In terms of the customers, delivery performance must be current, maintained and available for review upon demand.
- The supplier shall have an effective process for conducting root cause analysis, corrective and preventive action on missed shipments/ delivery fall downs to the customer.
- The supplier shall establish an effective process for analyzing commitments and customer notification on customer orders when there is a change in a supply constraint.
- The supplier shall establish an effective process for notifying the customer of missed commitments when product is sourced to multiple facilities (locations).
- The supplier shall establish a process to provide a timely response to informal customer delivery requests based on priority. The same tools used in the commitment process should be used.

4.24 New Product Introduction (NPI) & Transfer Process

- The New Product Introduction process must be formalized and should establish clear guidelines on product development, testing requirements, prototype launch and production hand-off. The process shall also establish the planning involvement by the senior management team.
- The NPI process must also establish internal “metrics” to track the performance (and success) of the NPI projects. These metrics must provide one with an overview of the projects, schedules, and performance and completion rates.
- The Quality Plans established during NPI must be adequate and data collected during this phase must be maintained.
- The supplier shall establish a well-defined and documented transfer process (globally and locally), identifying (at a minimum): roles for transfer teams, a corporate knowledge base, delineation of corporate/local responsibilities and guidelines for ensuring supply chain continuity for customers.

4.25 Firmware Control

- The supplier shall establish a development environment, configuration management and change management tools for firmware.
- The supplier shall maintain defects and the defect records should be recorded in a defect management system and tracked through to closure.
- The supplier shall have documented requirements for the firmware, which have been reviewed and baseline defined.
- Where appropriate the supplier should evaluate the use of Power on Self Test (POST) and Built In Self Test (BIST) designed into the firmware.

REVISION HISTORY

Revision	Author :	Date:	Change Description
A	Unknown	8/30/94	REVISED TO INCORPORATE REQUIREMENTS OF ISO-9001 AND BELLCORE TR-NWT-001252.
B	Unknown	10/10/94	REVISED PARAGRAPH 2.4, PROCESS CONTROL TO ADD THE REQUIREMENTS FOR THE SUPPLIER TO CONTACT ADTRAN UPON PROCESS OR MATERIAL CHANGES. ADDED REVISION SHEET TO DOCUMENT.
C	Unknown	1/24/95	REVISED PARA. 2.8. ADDED "ALL OUTER AND INNER CARTONS". ADDED PARA. 2.9 AND CORRECTED SUBSEQUENT PARAGRAPH NUMBERS.
D	Unknown	9/26/96	REVISED PARA. 2.4, REMOVED "WHERE APPLICABLE." REVISED PARA. 2.8, REMOVED REFERENCE TO PARA. 2.4, AND REVISED TO CLEARLY INDICATE ANY ESD GENERATING MATERIALS ARE NOT TO BE USED IN PACKAGING PRODUCT DELIVERED TO ADTRAN.
E	Unknown	11/7/96	REVISED TO ADD PAGE OF PAGE AND REVISION TO EACH PAGE.
F	Unknown	3/31/97	REVISED PARA. 2.0, 2.4, 2.7. ADDED TITLE TO 2.0, ADDED "PREVENTIVE" TO 2.7, ADDED REF. TO J-STD TO 2.4.
G	Unknown	1/6/98	REVISED PARA. 2.8 TO CLARIFY REQUIREMENTS FOR ESD PACKAGING MATERIAL, 2.8 REMOVED REQ'T FOR INNER CONTAINER BARCODE LABEL.
H	Unknown	12/9/98	REVISED PARA. 2.9 TO CLARIFY REQUIREMENTS FOR BARCODING OF PACKING SLIP.
I	Unknown	9/1/00	DELETED THE "A" AT THE END OF "610" IN SECTION 2.4, PARAS. 3 AND 4; REVISED PARA. 5 TO REFLECT ONLY THE IPC PROCEDURE; REMOVED "FREON TMS @ 103 F" IN PARA. 7. REVISED SECTION 2.5, 1ST PARA., TO CLARIFY ADTRAN'S AND SUPPLIERS' ROLES IN CALIBRATING NEW EQUIPMENT.
J	Unknown	2/19/04	CHANGED QUALITY MANAGEMENT SYSTEM REFERENCES TO ANSI/ISO/ASA Q9001:2000. ADDED REQUIREMENT THAT ALL ELECTRICAL COMPONENTS BE LESS THAN 18 MONTHS OLD. ADDED REQUIREMENT THAT BARCODING OF CONTAINERS AND PACKING SLIPS CONTAIN THE MANUFACTURER'S PART NUMBER AND DATE CODE.
K	Unknown	6/8/04	ADDED PURCHASING APPROVAL AUTHORITY REQUIREMENT TO DOCUMENT. ADDED PARAGRAPHS 2.4.1 THROUGH 2.4.1.7 TO DEFINE FIRST ARTICLE REQUIREMENTS. ADDED "ATTACHMENT A" FOR FIRST ARTICLE REPORT.
L	R. Wietlake	10/2/09	REVISED REVISION BLOCK. UPDATED PARAGRAPH 2.4.1 FIRST ARTICLE REQUIREMENTS. IDENTIFIED FIRST ARTICLE INSPECTION FORM IS Q100-1.
M	G. Giles	02/04/11	FOREWORD: UPDATED DOCUMENT OWNERSHIP AND REVISED STATEMENT TO REFLECT CURRENT REQUIREMENTS; SEC 1.3: REVISED TO ALONG WITH ADTRAN-TL 9000 RELEASE 5.0 REQUIREMENTS; SEC 2: NEW – ADDED REFERENCE SECTION; SEC 3: COMPLETE REWRITE TO BETTER CLARIFY SUPPLIER RESPONSIBILITIES FOR INSPECTION, CHANGE NOTIFICATIONS; DEVIATIONS, DATE CODE, PACKING LIST, AND CORRECTIVE ACTION REQUIREMENTS; ADDED SEC 4: TO DEFINE NEW SUPPLIER CAPABILITY ASSESSMENT ELEMENTS.

Appendix A



FIRST ARTICLE INSPECTION REPORT (Q100-1)

Part No. _____ Rev. ____ Sheet ____ of ____

Part Name _____

Supplier _____ Originator _____

Purchase Order No. _____ Quantity Received _____ Inspected _____

___ 1st Submission ___ 2nd Submission ___ Tooling Rebuilt/Refurbish

Certification Of Compliance

I certify that the parts furnished on the above shipment meets all the necessary Engineering Instructions, Mechanical Specifications and Necessary Requirements, and that the above parts have been inspected by this Company as set forth in the Customer Purchase Order.

Quality Manager _____ Date _____

Disposition

___ Approved ___ Rejected ___ Conditional Approval

___ Resubmission of 1st Article Required

Remarks: _____

ENGR/DATE _____ QUALITY _____

