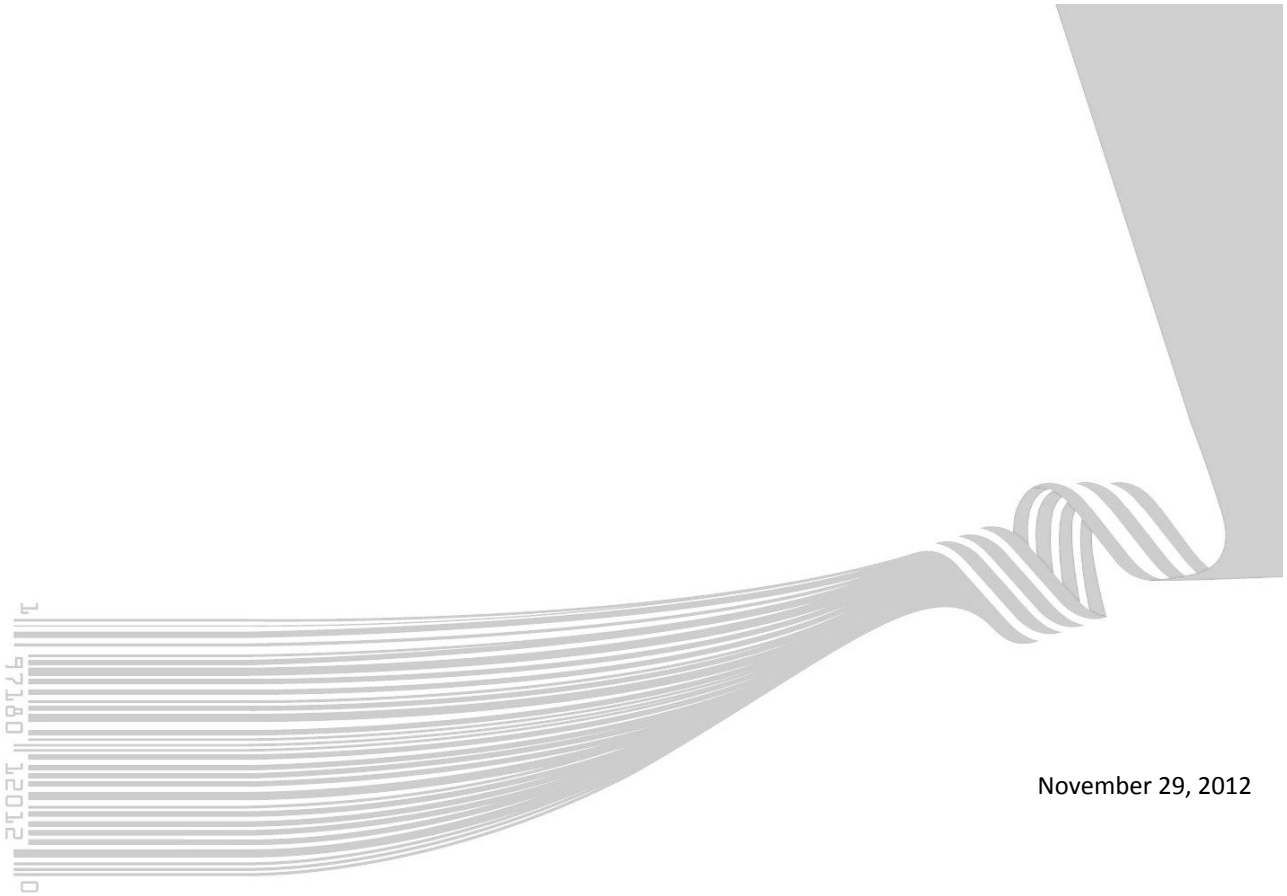
Toshiba Global Commerce Solutions (TGCS)

SUPPLIER QUALITY REQUIREMENTS (SQR)



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This document is maintained and distributed by TGCS Quality Engineering

1 Definitions

- "Authorized Third Party" shall mean a third party or their affiliates that are authorized to purchase the Products directly from Supplier for use in products that it produces or services for Buyer.
- "Bill of Materials or "BOM" shall mean the parts, materials or services that make up a Product .
- "Buyer" shall mean the TGCS entity that executed the Agreement or a Participation Agreement incorporating the terms of the Agreement.
- "Buyer Sourced Material" shall mean parts, materials or services that are listed on a BOM that has Buyer as the source of such materials.
- "Customer" shall mean Buyer's end customer for the Product or products that contain the Product
- "Defective Product" unless agreed in the Agreement to the contrary, a Defective Product is any Product that fails to comply with the Specifications.
- "Document" shall mean this document and any items that are incorporated by reference into this document.
- "Engineering Change" means any change to the Product
- "Key Contact Information" shall mean Supplier's contacts for business, quality and technical Issues, their name, address, e-mail address, phone number and emergency phone number(s).
- "Material Supplier" shall mean suppliers that provide parts or produce lower level assemblies for Supplier.
- "Non-Conforming Material" shall mean any Products that, upon delivery to Buyer, an Authorized Third Party or Buyer's Customer that fails to conform with any requirements of the Agreement.
- "Product" shall mean the same part number of associated Engineering Change(s) thereto that Supplier prepares for or provides to Buyer as may be fully described in the applicable purchase documents.
- "Product Quality Addendum" shall mean an optional document, provided to Supplier from Buyer, that sets forth specific quality requirements for a Product including technical, and/or quality goals, and any exceptions to this "Supplier Quality Requirements Document."
- "Supplier Quality Document" shall mean an optional document, provided by Supplier to the Buyer, that documents

Supplier's commitments and methods to meet all quality requirements of this Document and the Product Quality Addendum; Buyer Approved Waivers / Specification exceptions and the Supplier's Quality and Reliability Commitments.

- "Specification" shall mean the document or set of documents that are mutually agreed by the parties that describe the product to be produced and all associated requirements for that Product.
- "Statement of Work" or "SOW" shall mean a separate agreement that establishes the terms of purchase for the Product and which will incorporate this Document as a specification along with other required specifications for the product.
- "Subcontractor" shall mean suppliers that perform manufacturing related services for the Supplier as part of Supplier's production of the Product.
- "Supplier" shall mean the party to the SOW and any Supplier Affiliate that has agreed to sell the Product to Buyer, Buyer's Affiliates, or Authorized Third Parties. All requirements of this Document shall apply to both the Supplier and any Supplier Affiliate that produces the Product or any part thereof for Buyer or Authorized Third Parties.

Acronyms used in this agreement are described in Section 17 of this Document.

2 General

- Order of Precedence:
  In the event of any inconsistency between this Document and the Agreement or SOW, the terms in the Agreement or SOW shall have priority. For any documents that are incorporated by reference into this Document, in the event of an inconsistency, this Document shall have priority. If this Document contemplates future writings between the parties to establish the specifics of a quality program for a Product or set of products, that later writing shall have precedence over this Document. If any Definitions set forth in 1 above are also defined in the Agreement or SOW, the definition(s) contained in the Agreement or SOW shall have priority.
- Exceptions:
  Any agreed to exceptions to this Document will be set forth in the Product Quality Addendum, Supplier Quality Document or equivalent.
- Confidentiality:
  All information requested hereunder and all access to Supplier's or any Subcontractor or Material Supplier facilities, plans and processes shall be deemed to be non-confidential unless the parties specifically agree to execute a Confidential Disclosure Agreement (CDA) and CDA Supplement for the requested information or access.
- Waiver's:
  Any waiver's or deviations contemplated by this document shall require Buyer's Approval.

3 Introduction

3.1 Overview of Quality Program

This SQR Document outlines the minimum Supplier quality and process requirements for supplying Products to TGCS or Authorized Third Parties. These Products shall be manufactured to meet the mutually agreed Specification, using generally accepted industry standards and practices. Supplier shall have a quality program that exercises control over its manufacturing process and its Subcontractors and Material Suppliers to comply with the requirements of this SQRD Document and the Agreement.

Supplier must continually monitor and measure their quality performance, with results reported to TGCS in accordance with a schedule and in a format that is mutually agreed upon. Business and process controls will be required to prevent incidences of defective Product from reaching Buyer, its Authorized Third Parties or its Customers. All quality related

problems will require analysis, cause determination and corrective action as defined herein. Supplier, any applicable Supplier Affiliate and any Subcontractor or Material Supplier's process controls must be demonstrated. Supplier shall drive continuous improvement to reduce defects over time in accordance with annual goals that will be mutually agreed upon.

3.2 Supplier Quality Policy

The Supplier shall have a quality policy and documented quality program in support of their design and manufacturing operations which meets the minimum requirements of this document.

3.3 Supplier Organization

As part of the documented quality program, Supplier shall provide a Key Contact List. Supplier shall promptly notify Buyer of any changes to the Key Contact List.

4 Manufacturing Qualification and Process Control

Supplier's documented quality program shall include Product or process qualification plans for each Product.

4.1 Manufacturing Process Qualification

Product must be produced using the approved processes and Product or process qualification plan. Buyer reserves the right to qualify the Supplier's process. For processes qualified by Buyer, Supplier shall not make any changes without Buyer's prior written approval, which shall not be unreasonably withheld. The Supplier shall have a defined methodology for integrating new processes and process changes into Supplier's operations. This methodology shall include as a minimum the following:

1. The number and duration of consecutive successful trials required prior to declaring the process qualified
2. The potential effect of the new process or alteration on other required manufacturing operations (including those subcontracted)
3. The expected timetable for updating quality plans, flow charts, maintenance files, operator training plans, etc.
4. Ensuring related tooling is qualified as part of the process 5. The timing of the qualification process

Prior to a Product being purchased by Buyer and as part of a Specification or other requirements document, Buyer may provide additional qualification requirements for that Product's Qualification. Upon Supplier's agreement with those additional requirements, those additional requirements must be demonstrated.

4.1.1 Manufacturing Process Qualification Approval

Products produced for Buyer, or its Authorized Third Parties must have a documented qualification plan. That plan must be mutually agreed by Buyer and Supplier prior to qualification testing. Test results shall be provided to both parties promptly and in a format mutually agreed upon.

4.2 Manufacturing Process Documentation

The manufacturing process from receipt of materials to shipment of Product shall be documented and be made available to Buyer upon request. This shall include, but not be limited to the following:

1. Receipt and inspection of incoming parts and materials
2. Fabrication and/or assembly operations
3. Process work instructions
4. In-process inspections and tests
5. Final inspections and tests

6. Packaging, handling, storage, and shipment of materials or product
7. In-line fall-out/rework
8. Failure analysis and closed loop corrective action
9. ETN (Equivalent to New) where applicable and authorized by Buyer.
10. Stop Ship / Stop Build Process

4.3 Manufacturing Process Measurements

Suppliers shall establish manufacturing process measurements and yield objectives. Measurement collection and reporting methodology shall be documented. Critical process parameters will be mutually agreed by Buyer and Supplier. For any purchases using Supplier's published specifications, the agreed upon parameters shall constitute part of the Specification even if they are not included in Supplier's Published Specification. The method used to detect and contain product exhibiting defects or characteristics that may cause higher than normal failure rate than mutually agreed upon, shall be included in the process metric definitions. Examples of process measurement may include SPC (Statistical Process Control), in-process audits, functional tests, roving inspections, etc.

4.4 Manufacturing Test Plan

The Supplier shall develop a Product test plan to assure and measure conformance with the mutually agreed specification and applicable standards. Requirements for on-going Product test (e.g. ORT and ULT) will be included in the Product test plan and will be mutually agreed by the parties.

4.5 First Article Build and Inspection Requirements

Supplier shall document their first piece build inspection requirements for all new Products or revisions to existing Products. Where mutually agreed upon, the Supplier will provide their first article inspection report(s) to Buyer.

4.5.1 General Requirements

Elements of an acceptable process for First Article Builds include:

- Measurement, to the agreed upon specifications
- Identification and inspection of components and materials from receipt through processing, final inspection, and shipment
- Thorough and complete final inspection of the "First Article " with recording of the actual numerical measurements where appropriate.
- Retention of written "First Article Inspection" reports, test samples or coupons, certifications, and all other inspection records

Buyer reserves the right to conduct, and / or review results of Supplier's First Article Inspection on the first quantity of Product built following an approved change. Supplier shall perform Failure Analysis and take corrective action in accordance with the Agreement for all defects found during the first piece build.

4.6 Sub-Tier Procurement Requirements

Supplier shall manage their Material Suppliers and Sub-contractors by methods that may include, but are not limited to the following:

Managing supplier selection

Managing qualification, and quality management.

Performing ongoing assessments of supplier capabilities.

Driving sub-tier supplier continuous process improvement.

Environmental compliance (See Section 11.2.1)

With the exception of any materials purchased from Buyer, Supplier shall require all suppliers and sub-contractors to ensure that all material, and/or services procured in meeting the Supplier's obligations meet the agreed Specifications and other contract requirements and any mutually agreed changes thereto. This may include but not be limited to Product Specifications, BOM's (Bills of Material), and AVL's (Approved Vendor List). The Supplier shall not procure any parts, components, materials or services from sources other than those sources agreed upon during the part or product qualification, unless approved in writing by Buyer. Unless specifically agreed otherwise in the approval, Buyer reserves the right to limit or rescind any alternative source approval at any time and Supplier shall promptly adjust future sourcing to the approved source and take commercially reasonable efforts to stop receipt of additional product from other sources. If Buyer agrees, Supplier may use the approved alternative source material until it exhausts any inventory or non-cancelable orders placed with the alternative source. If Buyer does not agree to continued use and such material is custom to Buyer, Buyer shall reimburse Supplier for its reasonable costs of such material and Supplier shall transfer such material to Buyer at Buyer's reasonable expense or Buyer may require Supplier to dispose of such material at Buyer's reasonable expense.

4.6.1 Sub-Contractor and Material Supplier Selection

For all Subcontractors and Material Suppliers that are not specified by Buyer for use in production of the Product, the Supplier shall establish a sub-tier supplier quality management program which includes all elements of this Document. Suppliers' selection process shall include, but is not limited to the following: financial performance, competitiveness, technology offerings, and capabilities assessment. Sub-tier survey results and sub-tier management process assessments should consider the following aspects of sub-tier supplier capabilities: engineering support, supplier selection, AVL control, qualification, supplier audits, supplier quality management system, supplier performance monitoring, and quality issue management. Supplier shall take reasonable steps to prevent the use of high risk Suppliers in the production of Products for Buyer. A high risk Supplier is one that requires material waivers to any of the above criteria or that has financial performance below a level that is recommended by Buyer.

4.6.2 Subcontractor and Material Supplier Monitoring

The Supplier will provide reasonable evaluation, qualification, and on-going assessments of Subcontractor and Material Supplier capabilities to minimize risk to Buyer. The type and frequency of quality control indicators received (quality performance, root cause/corrective actions, problem tracking, etc.) will be documented. Subcontractor and Material Supplier management will be included as a critical process to review in Supplier self-audits. Subcontractor and Material Supplier management process documentation will include, as a minimum:

- Quality plan/requirements
- Audit criteria (template)
- Audit schedule and reports

4.7 Supplier Outgoing Quality Control

Supplier shall establish and maintain an outgoing quality control process. Specific requirements of that process and agreed quality levels and goals shall be established and will be mutually agreed periodically (usually annually). If Buyer and Supplier fail to reach agreement prior to the commencement of a new period, the quality levels and goals previously in effect will continue to apply until such time as mutual agreement on new levels and goals is reached.

4.8 Product Identification and Lot Traceability

The Supplier shall establish and maintain procedures and processes for the identification and lot traceability of critical items during all stages of production, as well as for delivery to Buyer, its Authorized Third Parties or its Customers. Identification must be traceable through to the finished Product by serial numbers or equivalent methods. Both forward and backward

traceability shall be available. If required, Buyer will provide information to Supplier on what identification items are required on the Product label.

4.9 Non-Conforming Material

The Supplier shall establish procedures for the control, identification, segregation, review, evaluation, and disposition of Nonconforming Material or Defective Products. This includes both material returned from the Authorized Third Party and field, as well as within the Supplier's process. Supplier shall allocate separate holding areas for nonconforming or defective materials, to prevent use in the manufacture of the Product or return to Buyer. This procedure will include the following items:

1. Reporting method to management and/or subcontractors
2. Failure Analysis (FA) team, procedures, turnaround time, and facilities
3. Corrective Action implementation
4. Customer feedback loop/customer involvement

Unless defined otherwise in the Agreement, Non-Conforming Material or a Defective Product is defined as a component or assembly related noncompliance that degrades the level of product service below the specified or reasonably foreseeable requirements. Defects may be either active (causing a non-conformance) or latent (likely to cause a non conformance in the future). Product manufactured using processes or procedures that differ significantly from those mutually agreed by the Buyer and Supplier may be considered defective.

4.9.1 Root Cause Analysis and Corrective Action

Supplier's responsibilities for Non-conforming Materials or Defective Products will be defined in the Agreement. Supplier shall assure containment of Nonconforming Material and Defective Products to avoid escape to Buyer and its Authorized Third Parties or its Customers. Supplier shall allocate separate holding areas for nonconforming materials, to prevent use in the manufacture of Product. Supplier shall notify Buyer in writing, or present to Buyer within a prompt but reasonable time frame, the root cause analysis and corrective action in the process and quality systems to prevent recurrence. At a minimum, the following items shall be addressed:

1. Defining the root cause of the defect or non-conformance
2. Providing an explanation of how the defective part(s) escaped the supplier's process
3. Providing target dates for the implementation of corrective actions
4. Providing a detailed analysis of the controls implemented to prevent reoccurrence of the defect
5. Supplier must show corrective action will be implemented across all similar processes making similar parts
6. Mitigating the affects of the Non-conforming Materials or Defective Products on Buyer, its Authorized Third Parties or its Customers

Buyer may require the Supplier to perform 100% inspection of the product at the supplier's location (prior to shipment) or at Buyer's or Authorized Third Parties location, and at the Supplier's expense.

5 Process / Product / Engineering Change Controls

5.1 Control of Parts

Supplier shall maintain documentation to identify all "work in process" (WIP) including the referenced Specification for each WIP item. Supplier shall have controls in place to control the possibility of down-level and/or returned parts being mixed with good stock. Unless otherwise agreed to by the parties, the FIFO (First-In, First-Out) inventory control methodology shall be used.

5.2 Document Control

All documents required for the production or testing of the Product such as software/firmware, engineering drawings, specifications, contracts, policies, procedures, manufacturing process flow charts, and work instructions (including test procedures) shall be under revision control and shall be made available to all necessary personnel in the manufacturing environment. Supplier shall a have a system for the effective updating/removal of any obsolete documentation from all manufacturing areas and its storage in accordance with a reasonable records retention program.

5.3 Supplier Change Notification to TGCS

Unless specifically agreed to the contrary, Supplier shall notify and obtain written approval from Buyer using an approved PCN (Process Change Notification) process, REA (Request for Engineering Action) process, or other mutually agreed to method, prior to any changes to the Product. These changes include,:

- Site location change
- Tooling change/addition/removal (encompasses tooling design or method change), including changes to fixtures, gages and test equipment.
- Process flow change (such as alternating a sequence of operations, adding or deleting an operation or inspection), including any chemical, mechanical or process changes which could affect the performance, reliability, safety, serviceability, appearance, dimension, tolerances. • Design change driven (portions controlled by the supplier)
- Packaging change
- Test/inspection change
- Test code change
- Component AVL/BOM/COL change, material source change
- Process (assembly or repair) chemical change

Other requirements for written approval of changes may be set forth in the mutually agreed Specifications or Product Supplements to this document. Buyer reserves the right to reject any change that requires Buyer's approval. Buyer's remedies, if any, for any unapproved changes will be set forth in the Agreement.

For all changes that do not require advance Buyer approval of the change, Supplier shall use reasonable efforts to promptly notify Buyer of such change(s).

5.3.1 Re-qualification:

Following Buyer's initial qualification of the Product, any changes to the Product or processes that require Buyer's approval may require re-qualification of the Product. As a condition of such approval, Buyer may require reimbursement of Buyer's reasonable costs of such re-qualification.

5.4 Supplier Engineering Change (EC) Process Control Requirements

Supplier's Engineering Change process must be documented. EC definition shall include (but not be limited to) any chemical, mechanical or process changes to the product, proposed by TGCS or Supplier, which would affect the performance, reliability, safety, serviceability, appearance, dimension, tolerances, or composition of BOM or material sources.

Suppliers are required to build product to the specifications and Bill of Materials (BOMs) released in the EC document. Any deviation from that BOM requires a documented approval from TGCS.

5.5 Supplier Process Control Requirements

The Supplier shall have process controls in place to prevent unintentional or accidental process changes from being made.

5.6 Engineering and Process Documentation Requirements

The engineering and process documentation must have a PDM (Product Data Management) type system of engineering content and change control. The PDM system shall include a BOM for all products and parts. Supplier will maintain access for Buyer to the latest revision of the BOM, regardless of who controls the master document and its content. All parts referenced in the BOM that are managed by Supplier will be identified and will have an engineering drawing, specification or equivalent. All parts referenced in the BOM that are managed by other companies, such as Buyer specified parts or commercially available items, will also have an engineering drawing, specification or equivalent available through the PDM System.

5.6.1 Tooling Documentation Requirements

All process and tooling documentation (including fixtures and gauges) shall be maintained and referenced to the revision level of their associated parts and assemblies in the BOM.

5.7 Acceptance of Final Product by TGCS

5.7.1 Part to Print / Defect-Free

All Supplier shipments to Buyer or Authorized Third Parties, shall be on a part-to-print, defect-free basis irrespective of any sampling plans by the Supplier to verify product quality prior to shipment. With the exception of any parts purchased from Buyer, Supplier shall be responsible for managing quality of their Product and any products purchased from Subcontractors and Material Suppliers.

5.7.2 Defective Products

Supplier's responsibilities for Defective Products, and Buyer's remedies for Defective Products shall be specified in the Agreement.

5.8 On-Site Support

Where defect levels exceed the committed quality rates, and upon Buyer's request, the Supplier shall provide on-site support at Buyer's or Authorized Third Party's location(s) perform sorting, failure analysis, corrective actions, and reporting. This on-site support shall be continuous until the defect level of the Products is determined to be within the committed quality rates for a sustained period as determined by Buyer.
Specific requirements will be identified in the Agreement, SOW, or as otherwise mutually agreed to.

5.9 Exception Shipment Approval Process

The Supplier shall not ship any Product that is known or likely to be non-conforming without Buyers written approval. In certain cases, Buyer may approve shipment of suspected non-conforming product if an adequate evaluation plan is approved prior to shipment.

6 Stopship / Stop Build Procedures

6.1 Quality Problem Notification to TGCS

The Supplier shall notify TGCS, and any impacted Authorized Third Parties of any quality, reliability or safety problems which may affect the Products in any way. TGCS reserves the right to stop builds or ships at the Supplier's manufacturing site(s) due to any issues that affect TGCS production yields, product reliability, or customer quality perception .

6.2 Problem Resolution

Stop ships and stop builds shall be treated with maximum urgency, and will not be rescinded until root cause is understood and corrective actions are in place. As such, Supplier shall provide immediate technical support in order to find the root cause and provide containment actions. The root cause explanations, corrective actions and material disposition will be documented and provided to Buyer.

6.3 Product Disposition

Supplier shall ensure that no quality compromise will be made when dispositioning suspected Defective or Non-conforming Product. There shall be no shipment of suspect Products to Buyer or Authorized Third Parties without Buyer's Approval.

7 Quality Goals, Continuous Improvement and Reporting

7.1 Quality Goals / Commitments

The ultimate goal is defect free product from a controlled process. The quality and reliability performance requirements will be documented in a Product Quality Addendum, Functional Specification, or other methods as determined by Buyer.

7.2 Continuous Improvement

The Supplier shall have a continuous improvement plan to both achieve agreed to quality goals and commitments, and to commit to use reasonable efforts to detect, eliminate, and correct the causes of all known defects, regardless of current product or process performance. For each improvement activity, the following information must be documented:

- Description of the activity
- The objective of the activity
- Progress checkpoint dates and the target date for completion of the activity
- Projected quality levels at checkpoints and upon completion of activity

Detailed information (i.e. root cause analysis, implementation phase-in dates, effectiveness assessment methodology, etc.) supporting individual actions for continuous improvement shall be included.

7.2.1 **Quality Techniques**

The Supplier shall use continuous improvement techniques to establish, maintain and improve quality. These techniques will be used in all stages of product life (i.e., design, qualification, ongoing production, and end of life production). The list of techniques will vary depending upon the stage of product life and quality performance.

Some examples of techniques include but are not limited to the following. Buyer and Supplier will mutually agree upon the techniques needed for a specific application, as required.

1. Fault Tree Analysis
2. Failure Modes and Effects Analysis (FMEA)
3. Gage Repeatability and Reproducibility Studies

4. Capability Analysis
5. Affinity / Ishikawa Diagrams

7.3 Quality Reporting

7.3.1 Periodic Summary Reporting

Buyer will require regular quality reporting, typically weekly or monthly. The Product Quality Addendum shall include specific reporting requirements and intervals.

7.3.2 Quality Metric Listing

The Supplier will maintain a summary table of all key measurements, definitions, frequency of reporting, goals, and continuous improvement targets.

8 Audits

8.1 Audits and Inspection by TGCS

Buyer shall have the right, subject to any agreed confidentiality obligations, to audit a Supplier's design, support, or manufacturing site that produces Product for Buyer. Buyer can also inspect the Product at any stage during development or production. Buyer will provide reasonable notification to the Supplier of its intent to audit or to inspect product or production facilities. Supplier documents relevant to the Product quality will be provided to Buyer for review upon Buyer's request.

Buyer's inspection of Product does not relieve the Supplier's responsibility to furnish Product that meets the agreed to Specifications. Buyer reserves the right to reject any Product that is found to be Non-conforming or Defective subsequent to inspection at source by Buyer.

8.2 Subcontractor Audit

This right to audit and inspect product or production facilities extends to Subcontractors or Material Suppliers, and shall be subject to any limitations in the agreements between the Supplier and their Subcontractors or Material Supplier.

8.3 Supplier Self Audits

The Supplier shall document and maintain a program of internal auditing to ensure continuing control and compliance to the procedures utilized to meet the requirements of this Document. Information regarding the results and corrective actions of self audits shall be made available to Buyer upon request.

9 Quality Records

Supplier shall establish and maintain procedures for identification, collection, indexing, storage, maintenance, and disposition of all quality records. As examples, these records may include raw data or control charts, Cp and Cpk for critical/identified process parameters, and records of all inspection and test activity to provide objective evidence that products have passed acceptance criteria. Records shall be maintained for time periods as agreed to between the Supplier and Buyer, typically at least 7 years. A listing of all quality records, with the retention period defined, must be maintained. Product Quality Addendums may contain additional requirements regarding the content and management of quality records.

10 **Standard Compliance Requirements**

10.1 External Standard Requirements

When referenced as a requirement in the Agreement, SOW, or Specification; independent lab requirements (i.e., UL, CSA, ISO, IPC, etc.) shall be met and proof of any required approvals shall be maintained. Upon request, Buyer shall be provided a list of the products that require this level of control and the methods used to assure product compliance (i.e., UL, certificate of compliance, independent lab analysis, etc). Agency inspections and results shall be made available to Buyer upon request. Ongoing agency inspection results and files shall be maintained in accordance with the document, data, and quality record control guidelines.

10.1.1 ISO 9000

Supplier shall be, and shall remain ISO 9001 compliant. Compliance can be either external accreditation or self-declaration. For external accreditation, a copy of the Supplier's current registration is required. For self-declaration, Supplier shall provide Buyer with a letter of assurance from Supplier's CEO/COO or other Officer of Supplier that self-declaration was done with due diligence based upon a previously executed internal audit report, and has had executive management review and approval.

10.2 TGCS Standards Requirements

When referenced as a requirement in the Agreement, SOW, or Specification; specific TGCS Standards requirements shall be met. These may include, but not be limited to Safety Standards, Country of Origin (COO), Shipping, Packaging, Labeling and Environmental Standard requirements.

10.2.1 Environmental Requirements

- Product shall comply with environmental requirements stated in applicable Agency, Certification Body, or TGCS environmental specification(s). Supplier shall have a process in place to provide and communicate the necessary physical Product content / composition information to TGCS. In addition, to ensure environmental compliance, the Supplier shall have a process that can verify the physical Product content / composition information of their Product and their subcontractor's Product.

10.2.2 Shipping to TGCS and Authorized Third Parties

The Supplier shall ship and package all Product per the mutually agreed Specifications.

11 Equipment Control

11.1 Calibration Requirements

The process for calibrating manufacturing and inspection equipment shall be defined and documented by the Supplier. As part of the calibration requirements, Supplier shall maintain records of the equipment calibrated, equipment labeling, calibration processes used, and the frequency of calibration.

11.2 Equipment Maintenance

Supplier shall document the process used for equipment maintenance, including preventive maintenance records, scheduling, identification, and storage and shall perform maintenance in accordance with such plans.

11.3 New Equipment Capability

A process for integrating new equipment and technology into the Supplier's operations shall be documented. Where appropriate, and when Supplier is requesting permission from Buyer to use new equipment or technology in the production of the Product, such request shall include:

- The number and duration of consecutive successful trials required prior to declaring the equipment qualified

- The potential effect of the new equipment or technology on other required manufacturing operations, including those sub-contracted
- How manufacturing operations (including subcontracted manufacturing operations) will be evaluated
- The expected timetable for updating all required quality plans, machine maintenance files, operator training plans, calibration schedules, etc.

Additional requirements for use of new equipment or technology in the production of the Product may be included in the Product Quality Addendum.

11.4 Buyer Owned Tooling

For any loaned Buyer owned tooling, the parties will execute a separate loan agreement that sets forth the responsibilities, and restrictions on use of such tools. All loaned Buyer owned capital tooling shall have assigned Buyer tool numbers. As part of any quality audits, and in addition to any rights Buyer may have under the loan agreement, Buyer may audit the Buyer owned tooling at Supplier's location.

11.5 ESD

The Supplier shall have ESD controls, materials, and procedures in place that are reasonable for the Product(s) being produced. All personnel that have direct contact with the Product or any portion thereof must be trained in ESD handling techniques and where appropriate, must wear equipment and clothing made specifically for avoiding a buildup of electrostatic charge. ANSI/ESD S20.20-2007, while not explicitly required to be used, describes the elements of an effective ESD program.

12 Training and Workmanship

Supplier shall provide initial and periodic training to manufacturing, test, and quality assurance personnel to ensure a skilled and effective workforce.

12.1 General Requirements

General training, such as computer fundamentals, component identification, component/commodity handling techniques, and electrostatic discharge (ESD) control shall be provided to all manufacturing and test personnel. Training that is specific to the Product, or is required of the personnel building that Product, and any related training documents, shall be documented and shall be provided to all personnel manufacturing the Product for Buyer. Periodic refresher training shall be provided.

12.2 Training Certification

The Supplier shall maintain certification and de-certification procedures for all production workers. Only those production workers that are certified to the proper level are to be allowed to participate in the manufacturing and test procedures. All production workers are to be re-certified periodically in accordance with the Supplier's documented training program. The Supplier shall maintain a training requirement matrix that outlines the type of training required for certification at each key position within the design and manufacturing process and the status of all workers in achieving such certification including the date of the last certification.

12.3 Workmanship

Supplier shall provide workmanship standards that are subject to Buyers Approval. All production shall utilize either the agreed to or approved standards. The Specification or the Product Quality Addendum may require additional or more stringent standards.

13 Buyer's Qualification of Products

Buyer's qualification of Products for use in Buyer's products, shall in no way relieve the Supplier of responsibility for any Products that are Defective or Non-conforming. Any Buyer test of the Product will not test all fail modes.

14 Related Documents

14.1 Product Quality Addendum (PQA)

The "Product Quality Addendum" is a document, provided by Buyer to the Supplier, that sets forth specific quality requirements for a Product including technical, and / or quality goals for the Product and any exceptions to this SQR Document.

14.2 Supplier Quality Document (SQD)

The "Supplier Quality Document" is an optional document, provided by the Supplier to the Buyer that documents any or all of the following, as applicable:

- Supplier's commitments and methods to meet all quality requirements of the SQRD Documents and the PQA.
- Buyer Approved Waivers / Specification exceptions.
- Supplier's Quality and Reliability Commitments.

15 Acronyms

ANSI	American National Standards Institute
AVL	Approved Vendor List
BOM Bill	of Material
CDA	Confidential Disclosure Agreement CNC
	Computerized Numerical Control
CPL	Components Placement List
COL	Change of Location
CSA	Canadian Standards Association
DVM	Digital Voltmeter
ECAT	Electronic Card Assembly and Test
EC	Engineering Change (Notice)
EEPROM	Electrically Erasable Programmable Read-Only Memory
ESD	Electro Static Discharge
ETN	Equivalent to New
FA Failure	Analysis
FCT	Functional Card/Component Test
FIFO	First-In, First-Out Inventory Control
ICT In-	Circuit Test
ISO	International Organization for Standardization
MAC	Media Access Control (Address)
MPQA	Master Product Quality Agreement
ORT On-	Going Reliability Test
PCN	Process Change Notice
PDM	Product Data Management (System)
PQA	Product Quality Addendum
QIN	Quality Information Network
REA	Request for Engineering Action
SOW	Statement of Work
SPL	Supplier Problem Log
SPC	Statistical Process Control
SPQL	Shipped Product Quality Level (aka IQL)
SQD	Supplier Quality Document
SQMS2	Supplier Quality Management System 2
TQA	Technology Qualification Application
UL	Underwriter's Laboratories

ULT Useful Life Test

16 Document Change History

EC	Date	Comments
	13 Nov 12	Initial Release