



2017  
Supplier Quality Requirements





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## 1.0 Purpose and Scope

This document provides an overview of the minimum quality, business process, manufacturing, compliance, and documentation requirements or expectations for Suppliers (as defined below) supplying Micron Technology, Inc. and its subsidiaries (“**Micron**”) with procured goods or services. Terms not defined within this document shall have the meanings ascribed to them in [Section 13.0](#) or the applicable Agreement.

The purpose of this Supplier Quality Requirement Document (SQRD) is to specify the Micron overall requirements for its suppliers and to define the specific requirements to Micron Automotive suppliers. These requirements extend from supplier qualification to new product development to high volume production.

This document and its content shall apply to all potential and incumbent suppliers who are in the process of qualifying to prove, or currently providing, procured goods and services, including subcontracting services to Micron. This document applies to all external direct material/service suppliers, including sub-tier, special process suppliers when identified and approved by Micron. This document can apply to indirect material/service suppliers as determined by Micron.

- In the event of any inconsistency between this document and any commercial Agreement (including any purchase order) or statement of work (“**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 writer shall have precedence over this document. If any definition(s) herein are also defined in the Agreement or SOW, the definition(s) contained in the Agreement or SOW shall have priority. Any agreed to exceptions to this document will be set forth in an equivalent Supplier Quality Requirements Document or another commercial document.



## 2.0 Responsibilities

- If a Supplier has any questions or concerns regarding the content of this Supplier Quality Requirements Document, they should contact Micron's Global Procurement Department or the applicable Global Category Supplier Manager.
- Suppliers are responsible for adhering to the SQRD requirements. Failure to meet these requirements may result in the loss of existing and/or future Micron business, in addition to reimbursement of costs to Micron for issues resulting from those failures.
- Suppliers are expected to comply with documented material/technical specific requirements.
- Suppliers are responsible for notifying the Micron Procurement Supplier Manager immediately for any potential Safety/Quality/Supply Chain issue.

## 3.0 General

### 3.1 Exceptions

- 3.1.1 Any agreed upon exceptions to this document shall be captured within an equivalent Supplier Quality Requirements Document or another commercial document.

### 3.2 Confidentiality

- 3.2.1 Any information requested by Supplier, that references content within this document and applicable to any Supplier's facilities, plans, procedures, and processes shall be deemed to be non-confidential unless it is specifically agreed upon by Micron and its Supplier(s) to execute a Non-Disclosure Agreement ("**NDA**") for such requested information or access.



## 4.0 Sourcing Compliance

Micron expects all suppliers to demonstrate commitment and conformance to the requirements outlined under the Supplier Responsibility section of the [Micron Supplier Expectations](#) website. Sourcing and Compliance assessments to be completed by a Supplier will be facilitated by Micron or on behalf of Micron through a 3rd party service provider. Additional to what is stated in Micron's Supplier Expectations, this SQRD provides further description of the requirements within the following sections:

- 4.1 Code of Conduct
- 4.2 Conflict Minerals
- 9.4 Product Content

### 4.1 Code of Conduct

At Micron, we conduct our business with integrity and in strict compliance with the law. Not only is it the right thing to do, but it makes good business sense. By acting with integrity, we earn the trust of our customers, shareholders, coworkers, regulators, suppliers and the communities in which we live and work.

Our Code of Business Conduct and Ethics is a key resource in our commitment to compliance and ethics. Today's laws and standards of business conduct are complex. The Code explains in a practical, easy-to-understand way many of the basic rules that apply to our business. It also explains our personal responsibilities, as a part of Micron, to speak up if we see something that does not seem right.

Our commitment to integrity must always come first. The quality of our reputation is just as important as the quality of our products and we earn our reputation by demonstrating our commitment to integrity in each and every business decision and action we take.

For more information regarding Micron's Code of Business Conduct and Ethics, visit <https://www.micron.com/about/our-commitment/governance/ethics>.

Micron is a member of the Electronics Industry Citizenship Coalition ("**EICC**"), which is comprised of leading electronics industry companies that have joined together to promote responsible working conditions, ethical business practices, and environmental stewardship globally throughout the electronics industry supply chain. EICC members adhere to a common EICC Code of Conduct, which addresses supply chain performance expectations for labor, health and safety, environmental practices, ethics and management systems.

Micron believes that our Suppliers' compliance with the EICC Code of Conduct supports our philosophy. Micron and its subsidiaries expect Suppliers to comply with the EICC code regardless of local business practices or social customs, and may be requested by Micron to demonstrate adherence to those codes.

For more information on the EICC and to view the EICC Code of Conduct, visit [www.eiccoalition.org](http://www.eiccoalition.org).



## 4.2 Conflict Mineral Policy

In support of global responsible sourcing, Micron is committed to ensuring that conflict minerals\* used in the manufacture of its Products do not directly or indirectly fund violence or human rights abuses in the Democratic Republic of the Congo or adjoining countries.

Micron requires its suppliers to source conflict minerals from smelters validated (or on the path to validation) as compliant with conflict-free sourcing standards like the Conflict Free Smelter Program. Micron also executes due diligence on the source and chain of custody of conflict minerals in its supply chain in conformance with the Organization for Economic Cooperation and Development Due Diligence Guidance for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas [OECD Due Diligence Guidance](#), encourages suppliers to adopt responsible sourcing practices, and collaborates with industry stakeholders through the Conflict Free Sourcing Initiative. To further transparency in the conflict mineral supply chain, Micron publicly reports the results of its due diligence annually and shares its due diligence results directly with its customers.

To learn more about Conflict Free Sourcing Initiative efforts to achieve a Democratic Republic of Congo Conflict Free supply chain and the Conflict Free Sourcing Program visit: <http://www.conflictreesourcing.org/>.

\*Conflict minerals are those minerals regulated by Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. They include columbite-tantalite, also known as coltan (and its derivative tantalum); cassiterite (and its derivative tin); wolframite (and its derivative tungsten); and gold.

### 4.2.1 Conflict Mineral Requirements

To help Micron achieve its conflict mineral policy objectives, Micron requires Suppliers to comply with its conflict mineral programs. Supplier compliance includes:

- Providing complete, updated Conflict Minerals Reporting Templates (“CMRT”), as requested. CMRTs must disclose the source of conflict minerals that may be present in Products sold by Supplier to Micron—including the identification of the smelters from which the conflict minerals originated;
- Updating CMRTs within two (2) weeks of any smelter or refiner changes within the entire supply chain. Such changes may include adding a new smelter, removal of a smelter, or when a smelter changes on the CFSI list.
- Adopting a conflict mineral policy dedicated to the goal of achieving a conflict-free supply chain;
- Participating in and facilitating audits of Supplier’s facilities, conflict mineral policies, conflict mineral procedures and associated records;
- Adopting contractual provisions in Supplier’s supply chain agreements that direct successive upstream suppliers to adopt conflict mineral policies and complete necessary conflict mineral diligence surveys.



### 4.3 Supply Chain Risk Management

As part of Micron's Supply Chain, Micron requires suppliers to have Business Continuity processes and plans for the manufacturing locations to enable continuity of supply. Considering the complexity of the supply chain, Micron uses risk intelligences and analytics to effectively and efficiently respond to disruptive events that occur around the globe. To support Micron, a supplier can be requested by either Micron or on behalf of Micron by s 3rd party service provider. It is Micron's expectation that the supplier responds to the inquiry in a timely and accurate manner.

These requests may include:

- Collecting basic information about supplier's supply chain resiliency using Supply Chain Mapping, which includes data-points such as manufacturing locations, emergency contacts, recovery time objectives, and locations of critical sub-tier suppliers.
- Collecting and evaluating business continuity process (BCP) data on Micron's suppliers.
- Suppliers' responding and providing timely incident updates, impact assessments, and/or digital coordination between supply chain partners during disruptive events.



## 5.0 Supplier Quality

### 5.1 Quality Management Expectations

- 5.1.1 All suppliers are expected to have an established Quality Management System (“**QMS**”) to ensure that documented quality business processes, controls, and systems are in place to prevent out of control or non-conforming Product from reaching Micron, as defined within this document or any other supporting Agreement. It is expected that a Supplier’s executive management have the responsibility for reviewing the QMS at defined intervals sufficiently to ensure its effectiveness.
- 5.1.2 As part of the QMS, Supplier shall provide Micron a Key Contact List and a current Quality Organization structure upon request. Supplier shall promptly notify Micron of any changes to the Key Contact List or the Quality Organization.

### 5.2 Quality Policy

- 5.2.1 Suppliers shall have a documented quality policy that supports their manufacturing processes and provides references to all quality related processes, controls and systems. This quality policy should include process or Product qualification plans for any Product being provided to Micron.

### 5.3 Quality Records and Documentation

- 5.3.1 Micron Suppliers shall have established procedures for collecting, storing, maintaining and disposing any quality related documents or records. These records may include raw process data, qualification data, statistical data, test or inspection data that supports quality requirements for goods or services procured by Micron. Quality record retention will be retained for the length of time that the product is active for production & service requirement, plus one calendar year unless otherwise specified and agreed upon between Micron and the Supplier. Micron may from time to time and in its sole discretion, require Supplier to adopt additional procedures or practices regarding management of quality requirements.

### 5.4 Quality Methodologies (concepts or techniques)

- 5.4.1 To ensure continuous improvement of quality, Suppliers must use appropriate methodologies or processes during all phases of Product life (i.e. conception, design, qualification, production, testing, and inspection, etc.). Examples may include, but are not limited to, the following or as otherwise agreed between Micron and the Supplier.
- Failure Modes and Effects Analysis (“**FMEA**”) and Quality Control Plan;
  - Statistical tools for each process during quality planning;
  - Technical risk assessment
  - Gage, repeatability, and reliability studies;
  - Design of Experiment activities;
  - Root Cause Analysis or other problem solving methods;
  - Maverick Product Elimination (“**MPE**”) / Zero Defect type program.



## 5.5 Quality Reporting

- 5.5.1 As agreed upon with Micron, Suppliers are required to provide quality reports on a periodic or as needed basis. Such reporting may include, but is not limited to, key metrics, measurements, goals, or continuous improvement results.

## 5.6 Supplier Quality Control Requirements

- 5.6.1 Micron requires Supplier to have proper monitoring & control at all areas (Incoming, in-process & outgoing) and implement acceptable statistical methodology deployment. It is part of Micron's expectation that suppliers provide Statistical Process Control ("**SPC**") data for any Product or material provided to Micron as defined/requested.
- 5.6.1.1 If requested by Micron, Supplier shall provide periodic SPC reports for the specified Product, unless agreed upon otherwise. At a minimum, this data may include calculated Cp and Cpk for all parameters for which the calculations will apply. The calculation methodology of such reporting should be aligned with Micron's requirements.
- 5.6.1.2 If required, Supplier will provide SPC data ensuring adequate control of the manufacturing process.
- 5.6.1.3 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 First In, First out ("**FIFO**") inventory control methodology shall be used.
- 5.6.2 Certificates of Analysis ("**CoA**") or Certificates of Conformance ("**CoC**")
- 5.6.2.1 Materials or items that require actual composition reporting will be specified in Micron Material Product Specifications or other Quality specification documents applicable for the various departments or process areas within Micron (i.e. Front End Materials, Back End Materials, Mod/SSD, etc.). When required, each lot or batch in a shipment must be analyzed by the Supplier for (at least the minimum) parameters outlined in the agreed upon Product Specifications or other Quality type requirement documents.
- 5.6.2.2 Supplier shall provide CoAs or CoCs, as applicable, to Micron prior to, or at time of, receipt of the Product by Micron from Supplier. The CoA or CoC, as applicable, must be sent to the appropriate email, online, FTP (File Transfer Protocol), or fax location as agreed upon with the designated Micron site representative.



### 5.6.3 Ship-To-Control and Statistical-Process-Control

- 5.6.3.1 Micron utilizes a Ship-To-Control (“STC”) process for manufacturing related “direct materials”. Suppliers may be requested to participate in applying the principles of Ship-To-Control to front end raw materials Products procured by Micron.
- 5.6.3.2 Micron and the Supplier agree to apply the SEMI-C64-0308 for determining the statistical guidelines for Ship-To-Control process subject to the clarifications and exceptions set forth herein.
- 5.6.3.3 Upon the initiation of an Agreement, the Supplier and Micron will review and agree on the “Key” and “**Control**” elements of each material or Product.
- “**Key**”: those parameters identified within a material spec as non-shippable if found to be out of control (“**OOO**”).
  - “**Control**”: pre-notification of those parameters identified within a material spec for joint MRB discussions if found to be OOC.
- 5.6.3.4 Suppliers will track and may be asked to provide SPC data on all measured elements on a pre-defined frequency (no longer than a quarterly basis). As outlined in the Semi standard, STC/SPC data and control limit reviews shall occur on a yearly basis, but Micron and/or the Supplier may request a review for additions or reduction in STC/SPC parameters based on a change in process or significant shift in the data.
- 5.6.3.5 Unless agreed upon jointly, all measured parameters require analysis which will produce actual values until a target limit has been established by Micron and the Supplier.
- 5.6.3.6 Periodic STC and SPC data review of parameters shall include calculated Cp and Cpk values for any parameter captured in a Product or Material Specification. All defined key/control parameters should meet a minimum Cpk @ 1.33 and Cpk @ 1.67 for Automotive parts.
- 5.6.3.7 All certified analysis will be done from the shipping container or as close to the end of the production line as possible.

### 5.6.4 Backend Material Quality Requirements

- 5.6.4.1 Based on internal processes and procedures, backend related materials, Product, and components (used in the module, SSD, assembly, test, and packaging areas.) have separate specification requirements that may vary from front end material (i.e. Fab, wafer, etc.) specifications. For this, there are specification documents established for materials, such as; hardware, capacitors, resistors, inductors, printed circuit boards, SSD connectors, etc.
- 5.6.4.2 Please refer to [Section 15.0](#) Reference Material for the specific document titles. These specification documents are available upon request.

### 5.6.5 Maverick Product Elimination

- 5.6.5.1 Micron’s expectation is that all such suppliers have systematic controls in place to detect and prevent shipment of maverick Product. Micron recommends referencing JEDEC JESD50B.1. No maverick product can be shipped to Micron or Micron Subcontractors without approval or authorization from Micron.



## 5.7 Non-conforming Material

- 5.7.1 It is a general expectation of Micron, that all Suppliers have documented and established processes for identifying, containing, and disposing of non-conforming direct materials (both front end and back end). This is intended to prevent non-conforming material or Product from reaching and impacting Micron. Micron expects cooperation from its Suppliers in providing lot numbers, batch numbers, manufacturing dates or any other pertinent information to help ensure with the segregation of suspect or non-conforming materials.
- 5.7.2 Direct materials or Products received at any Micron site which are not conforming to the requirements contained in a Materials Specification Document or another specified Quality specification document, will be rejected as non-conformance by the Supplier. Micron, as the customer, may issue a Supplier Quality Notification (“SQN”). Please refer to [Section 6.3](#) for the details of this process.
- 5.7.2.1 If non-conforming material or Product is identified at any Micron location or Micron’s customer location, the Supplier will be contacted by Micron for disposition. Micron disposition activities, unless agreed upon elsewhere, may include, but are not limited to, the following.
- Micron certifies stock at the Supplier’s expense.
  - Supplier hires an independent source for certification or sorting of stock at Micron location.
  - Supplier sends a representative to Micron’s location to certify stock.
  - Supplier authorizes material to be scrapped or returned to Supplier location at the Supplier’s expense.
- 5.7.2.2 Costs incurred by Micron that are attributed to poor Supplier Product quality may be charged back to the Supplier.
- 5.7.3 Micron utilizes various business processes and methods for identifying, monitoring, and addressing non-conforming Product. The following are examples of the processes or methods that may be used at the Micron locations to identify or detect non-conforming Product:
- Material Review Board (“MRB”)
  - Key Material Group (“KMG”) activities
  - Incoming Quality Control (“IQC”) activities
  - In-process SPC
  - MPE
  - SQN
  - Testing and Inspection



## 5.8 Defective Products

- 5.8.1 Supplier's responsibilities for defective or non-conforming Products and Micron's remedies for defective Products shall be specified in an Agreement.

## 5.9 On-Site Support

- 5.9.1 Where defect levels exceed the committed quality specifications or rates, and upon Micron's request, the Supplier shall provide on-site support to perform sorting, failure analysis, and corrective action 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 Micron. Where mutually agreed to by Micron and Supplier, continuous On-Site Support will be provided by the Supplier at Micron's or Micron's authorized third party's location(s) to perform sorting, failure analysis, and corrective action reporting. Specific requirements will be identified in the Agreement, SOW, or as otherwise mutually agreed to in writing.

## 5.10 Traceability

- 5.10.1 Suppliers shall have a documented process or procedure established that provides identification and traceability on goods or services provided to Micron. If agreed upon, it would be expected that both forward and backward traceability be captured, through serialization or some other appropriate method.
  - 5.10.1.1 Unless otherwise agreed upon with Micron, identification information is required on the Product label.
  - 5.10.1.2 Each Product, manufacturing lot or batch must be identified with a unique number.
  - 5.10.1.3 This number must have complete traceability through the supplier manufacturing process, for materials, and equipment.
  - 5.10.1.4 Supplier must maintain a record of all materials used in the manufacture of each Product and maintain documentation as evidence of conformance to the specifications. The documentation must be maintained for the length of time that the product is active for production & service requirement, plus one calendar year from the date of manufacture or the date of the material's shipment to Micron.



## 5.11 Product Qualification/Approval

- 5.11.1 All Products supplied to Micron must be manufactured or produced using an approved process plan, unless otherwise captured through an approved and documented Agreement with Micron.
  - 5.11.1.1 After initial qualification of a Product a final qualification package should be documented as PPAP. Any changes made to such records as referenced in [Section 10.0](#) of this SQRD, may require re-qualification unless otherwise agreed upon.
  - 5.11.1.2 Suppliers of direct materials and capital equipment must maintain a minimum of ISO9001:2015 certification for their applicable manufacturing sites. See [Section 9.2.1](#) for specific requirements.
  - 5.11.1.3 New Suppliers must complete the applicable qualification process prior to supplying Products to Micron.
- 5.11.2 For identified supplied materials, a PPAP (Production Part Approval Process) will be documented and submitted by supplier to Micron as the process of record for Qualification.
  - 5.11.2.1 Suppliers shall ensure that PPAP documentation and sample submissions are in accordance with the requirements of the latest edition of Automotive Industry Action Group (AIAG) PPAP Manual. Suppliers shall only submit PPAP packages upon qualification completed and production released. Each supplier is responsible for meeting all requirements before submission to Micron, including obtaining Micron approvals for any change requests.
  - 5.11.2.2 Supplier submission of a non-conforming or late PPAP package will be recorded as a supplier performance failure and could affect the suppliers' performance rating. Micron will determine the level of PPAP submission and any special requirements if applicable.
  - 5.11.2.3 When applicable, suppliers shall include in the PPAP submission the Engineering Specification (ES) test plan and the ES test results. An approved/accredited laboratory shall conduct the ES tests.



## 6.0 Supplier and Sub-Supplier Management

### 6.1 Supplier Selection/Qualification

- 6.1.1 At Micron, Supplier selection/qualification decisions are based on an established team approach that involves Global and/or Site Purchasing, Research and Development (“R&D”), Operation Central Teams (“OCT”), etc. This team approach is often necessary due to Micron’s reliance on technical advancement in collaboration with Suppliers. As a result, other functions outside of Procurement; such as R&D, Manufacturing, Compliance, Engineering, or Process alignment, play a strategic role in the final outcome of a Supplier being selected.
- 6.1.2 Criteria for Supplier Selection
- 6.1.2.1 All Micron suppliers of materials and services affecting production material is required to be certified against ISO9001:2015 as minimum for quality system requirements. Suppliers shall also comply with Micron specific requirements defined in the Supplier Quality Requirement Document as distributed.
- 6.1.2.2 All suppliers shall, at minimum, maintain and update their certification status once per year. Suppliers shall immediately communicate any change in certification or status to Micron respective Procurement Supplier manager. Suppliers are to provide or upload copy of their quality & other pertinent certifications in the assigned Micron system. Failure to provide the latest certification may result in losing the qualification status with Micron.
- 6.1.2.3 Embedded control software developed by a supplier and delivered to Micron as a primary work product or a product delivered to Micron which contains embedded control software shall satisfy IATF 16949 Software Assessment requirements and integrity. In such case, Micron requires that: 1.) suppliers produce evidence of self-assessment, 2) supplier agrees to be audited by Micron upon request, 3) upon Micron request, a third-party assessment is conducted. If the supplier does not meet the above requirements at start of an awarded project, an improvement program much be established to meet Micron requirements before start of serial production.
- 6.1.2.4 Suppliers shall have email, Internet access and Internet browser as a minimum for e-Business capability. This is required to participate in Micron’s web based applications and communications. These include but are not limited to:
- Supplier Quality Notification (SQN)
  - Supplier Change Management System (SCM)
  - Supplier On-boarding System
  - Micron Global Supplier Quality Requirement Database
  - Supplier e-Data Transmission (i.e. eSupplier, Certification, Qualification Status, etc.)



6.1.3 New Supplier Qualification - New Suppliers who wish to supply to Micron shall:

- 6.1.3.1 New Suppliers who have not completed the required registration process may be awarded business on the condition that they successfully pass the Supplier On-site Audit with minimum score of 70% and have a reasonable roadmap defined for certification.
- 6.1.3.2 Meet all commercial and financial requirements of the relevant Micron product line.
- 6.1.3.3 Complete all required Supplier On-boarding assessments/questionnaires.

6.1.4 Upon completion of a qualification, identified suppliers shall have prepared the evidence of PPAP completion and acceptance by Micron team. Suppliers shall ensure that any PPAP documentation and sample submissions are in accordance with the Micron defined list. Any sub-tier PPAP that influences a designated characteristic must also include at minimum, Material Certification (includes bulk material where applicable), PFMEA, MSA study, Control Plan, and Capability Study. The submitted PPAP package from suppliers will be used as POR (Process of Record) for Micron. The established PORs must not change without prior, written agreement and approval from Micron. Those changes may include but are not limited to:

- Changes to outside or sub-tier suppliers, manufacturing sites
- Addition / deletion of capital equipment
- Addition / deletion of tooling and / or gages
- Changes to manufacturing methodology
- Changes to internal secondary processing
- All changes of submitted PPAP need to be submitted to Micron Supplier Change Management System and refer to Micron Supplier Change Management Policy for details. See [Section 10.0](#) for specific requirements

6.1.5 Suppliers are responsible for meeting applicable PPAP requirements. Supplier submission of a non-conforming or late PPAP package will be recorded as a supplier performance failure and could affect the supplier's performance rating.



## 6.2 Sub-Tier Supplier Management

- 6.2.1 All suppliers shall have a documented and established supplier management program or process that describes the methodologies for managing their suppliers or sub-contractors (a **“Sub-Tier Supplier”**). These methods could include, but are not limited to, Sub-Supplier selection, technology, background, production/manufacturing capabilities, scorecards or performance evaluations, qualification management, continuous improvement activities, conflict minerals, social and environmental compliance, financial analysis, quality system requirements, cost competitiveness, etc. This process should also include appropriate risk assessment activities, including, but not limited to, Sub-Supplier audit, Sub-Supplier performance evaluations, process control capabilities, etc., to ensure that high risk Sub-Suppliers are not introduced into the Product or service that is being provided to Micron. The Sub Tier Supplier Management Process Guideline (CQI-19) (**“AIAG”**) can be used as reference.
- 6.2.2 All Micron suppliers shall have capabilities to manage their respective supplier (regardless of how directed) including PPAP submission, supplier performance, APQP disciplines and periodic auditing. Micron, when deemed necessary, may audit the critical processes of sub-tier suppliers to assure that proper controls are in place throughout the entire supply stream. Suppliers to Micron shall ensure they audit and manage critical processes such as heat treating and plating and when directed, use the required format. Special process audits are to follow AIAG’s CQI-9 (teat Treat), CQI-11 (Plating), CQI-12 (Coating), CQI-15 (Welding) and CQI-17 (Soldering) requirements. These sub-supplier certifications and /or self-assessments must be maintained and shared with Micron upon request. Action plans to address gaps are to be tracked and shared when required.
- 6.2.3 Sub-tier suppliers have a tremendous impact on the quality of the final component. Whether they provide materials, services or sub-components their influence is so profound that it is critical for each Micron’s suppliers to communicate all Micron requirements to their suppliers and have a supplier performance monitoring plan in place to ensure the compliances. This system shall include a function that tracks and reports the quality and delivery performance of their sub-tier supply base. Suppliers may be requested to demonstrate the effective management of sub-tier suppliers through documented corrective actions and verification activities.



### 6.3 Supplier Quality Notification

- 6.3.1 Incumbent Suppliers are expected to adhere to Micron’s Supplier Quality Notification (“SQN”) process as it pertains to the non-conformance to material specifications, equipment specifications, software/hardware specifications, delivery, environmental, health and safety guidelines. This process follows the standard 8 D approach, which covers containment, root cause, corrective action, preventative action, and close-out activities. An instructional tutorial, that explains the Micron expectations, is available upon request. New Suppliers to Micron would also be expected to adhere to this process
- 6.3.2 Micron’s Supplier Corrective Action Request Criteria
- A HIGH severity SQN represents a Product or Supplier dependent non-conformity with a direct impact to ramp or production such as an immediate material shortage, systemic failure to perform, equipment down situation or a safety issue.
  - A MEDIUM severity SQN is applied to a corrective action request when a Supplier fails to meet contractual or pre-established expectations for the support of goods and services that do not result in an immediate impact to ramp or production.
  - A LOW severity SQN is used to document individual incidents but does not require a root cause analysis or formal corrective action plan from the Supplier. Multiple or systemic low severity incidents can result in a medium or high severity SQN. For a low severity event the supplier will be expected to complete the D0 and then sign off the D8 section acknowledging receipt of the SQN.
- 6.3.3 Micron requires its Suppliers to adhere to all sections of the G8D. It is expected that Supplier responses be communicated back to Micron within the timelines depicted in the table below:

Supplier Response Timelines			
G8D Steps	High	Med	Low
Notification - D0	24 hours	24 hours	14 days
D0 - D3	3 days	3 days	n/a
D0 - D5	14 days	23 days	n/a
D0 - D8	60 days	60 days	14 days

- 6.3.4 Micron expects its suppliers to have an established process for addressing non-conformity issues with its Sub-Suppliers. At a minimum, this process should utilize the 8 Discipline methodology which is used for performing and communicating containment, root cause analysis, corrective and preventative action measures.

### 6.4 Supplier Performance

- 6.4.1 A globally managed Supplier’s performance is evaluated on a periodic cadence based on several criteria, as determined by Global Procurement. Site managed Suppliers are evaluated based on similar criterion as determined by the Site Procurement team.
- 6.4.2 Supplier performance evaluations consist of five (5) main scoring categories; Quality, Cost, Customer Satisfaction, Supplier or Supply Chain Performance, and Safety.



## 6.5 Continual Improvement Program

- 6.5.1 A Supplier may be asked to participate in Continuous Improvement Programs (“CIP”) that are intended for developing improvement plans. These activities may be included in post Supplier performance evaluation activities, post on-site audit findings, standard CAPA plans or may be initiated as a separate activity.

## 6.6 Supplier Assessments

- 6.6.1 All new potential Suppliers, at a minimum, will be required to complete a Level 1 pre-assessment. The Level 2 Supplier Assessment, which is a more thorough assessment, may also be required of potential new Suppliers, but is typically reserved for incumbent Suppliers that are key to the manufacturing process.
- 6.6.2 Supplier Assessment activities are driven through Global Procurement with the collaboration and involvement between site Procurement teams and other stakeholder groups to provide the methods for which Micron manages Supplier Assessment activities.
- 6.6.3 Supplier assessments, such as BCP, Supply Chain visibility, sourcing compliance, and quality are sent to Suppliers to determine a Supplier’s overall risk profile. Micron utilizes a Supplier Segmentation process to conduct a periodic review and classification that helps determine Supplier management plans or actions. The segmentation utilizes four main criteria; relationship, performance, criticality, quality, supply chain, and risk.
- 6.6.4 Global Procurement will utilize this process and application to weigh and rank Supplier viability, as well as analyzing risk. The ranking and weighting will only provide input to the decision and is not intended to be the only method utilized to select a Supplier. The process can be used for both incumbent and potential new Suppliers.
- 6.6.4.1 The Micron Level 1 assessments covers the following subject areas:
- General Information/Ethics
  - Financial
  - Quality
  - Supply Chain



6.6.4.2 The Micron Level 2 assessments cover the following subject areas;

- Internal Quality
- Document Control
- Change Management
- Capacity Management
- Inventory Control
- Supply Chain Management and Incoming Material Control
- Security/Confidentiality
- Human Resources, Ethics, and Training
- Environment/Health/Safety
- Business Continuity Planning
- Product Design Development
- Continuous Improvements/Costs
- Supplemental – Software Design and Development
- Calibration (where applicable)

\* NOTE: EICC members can substitute the EICC Self-Assessment Questionnaire (“SAQ”) with the Level 2 assessment

## 6.7 Supplier Audits/Visits

6.7.1 Supplier audits and visits are conducted by Micron and are based on various criteria, as identified and determined through the Micron Supplier Segmentation and other Risk Assessment processes.

6.7.2 On-site Supplier audits are led by Global Quality through collaboration and involvement of Global Procurement and technical stakeholders. Supplier risk assessments and performance based data are utilized as the foundation for Supplier audits. Below are examples of the minimum criteria that may be used to trigger an audit or commercial visit.

- Major change in ownership
- Increase in business
- History of quality or performance issues
- Change in manufacturing location
- Compliance and Ethics
- Supplier Management activity
- High risk assessments
- High social responsibility risk
- Quality systems validation
- New Supplier
- New material or Product
- Customer Request or requirements



## 7.0 Calibration Requirements

### 7.1 Calibration

- 7.1.1 Suppliers must have established procedures or processes for ensuring proper calibration of all manufacturing, inspection, or analytical equipment. This requirement should also include maintenance of calibration records, calibration labels, and calibration frequencies. Suppliers are expected to ensure that any third-party calibration activities are managed appropriately in accordance with the ISO17025 standards.
  - 7.1.1.1 All calibration or lab service Suppliers to Micron shall be ISO17025 accredited, unless a waiver has been formally granted and documented by an appropriate Micron stakeholder (typically, a procurement agent). Suppliers who are not accredited to ISO17025, may be asked to provide supporting documentation as evidence for meeting or exceeding the intent of ISO17025 requirements.

### 7.2 Testing and Correlation

- 7.2.1 The Supplier's standards and testing procedures must be made available to Micron upon request and if requested, may be correlated with Micron's own testing methods and procedures.
  - 7.2.1.1 The Supplier is required to maintain all test equipment according to a recognized certification and calibration (i.e. ISO17025) program.
  - 7.2.1.2 The Supplier is responsible to ensure that test equipment and methods meet applicable measurement sensitivity requirements.



## 8.0 Commercial Requirements

### 8.1 Quotations

- 8.1.1 Potential Suppliers of goods or services to be provided to Micron may be contacted with a request for a quote by Procurement. Quotations that are submitted will be evaluated upon receipt. It is an expectation that all Micron Suppliers meet all criteria within this document, as applicable, to be considered for acceptance.

### 8.2 Premium Freight

- 8.2.1 Premium freight incidents are tracked internally within Micron as a method of measuring cost impact, as well as overall supply chain health.
- 8.2.2 It is expected, when applicable, that any incident of premium freight be submitted to Micron for review. This submittal should at a minimum include a detailed explanation of the incurred cost or expense.

### 8.3 Labeling and delivery

- 8.3.1 It is the expectation that all Suppliers meet a 100% On-Time Delivery performance, unless otherwise agreed upon.
- 8.3.2 Suppliers are expected to meet the terms and conditions for ensuring that all Products delivered to Micron are adequately packaged and labeled, as agreed upon with the Micron buyer.



## 9.0 Regulatory, Compatibility and Standard Compliance Requirements

### 9.1 General Compliance Requirements

- 9.1.1 All Suppliers providing goods or services to Micron must satisfy current legal and other industry requirements regarding human health, safety, ethics, and environmental protection. Supplier shall provide information, disclosures and certifications reasonably requested by Micron to assure Micron's compliance with such legal requirements.

### 9.2 ISO and IATF Requirements

- 9.2.1 Suppliers to Micron shall achieve conformity to ISO 9001:2015 as a minimum requirement. Suppliers and sub-suppliers who are identified as special process (i.e. Automotive products) providers are required to adhere to the specific requirements as set forth in the IATF16949. Micron expects all the direct material suppliers, supplying into automotive, comply to IATF16949 requirements or have a plan to achieve conformity to IATF16949. Note that certification to this specification will only be accepted when issued by an IAQB recognized registrar. This is consistent with the expectations for Micron's customers and our business system that complies to IATF 16949 requirements. The scope of the requirement affects sub-assembly, sequencing, sorting, rework, and calibration services in addition to direct material suppliers.

### 9.3 General Compatibility Requirements

- 9.3.1 Supplier shall provide information, disclosures and certifications reasonably requested by Micron to assure all Products, chemical substances present in the Products, and constituents thereof are compatible with all Micron facilities, tools, equipment and processes. Such information shall include full disclosure of the exact identity of all materials, chemical substances and constituents present in any Product or material provided by Supplier to Micron. Supplier shall disclose any and all chemical components to Micron chemical management/compliance and safety departments that have the potential to harm any end user or adversely affect Micron facilities, tools, equipment and processes. Supplier shall also disclose and provide any known existing data regarding Product and chemical safety to Micron chemical management/compliance and safety departments.



## 9.4 Product Content Compliance

- 9.4.1 The following sections are focused on ensuring compliant content of Products supplied to Micron and finished Micron products. Product content refers to the substances, chemicals, or materials present in a Supplied Product and/or finished Micron products. Products supplied to Micron must conform to all applicable product content legal requirements and Micron requirements.
- 9.4.1.1 Supplier's Products must comply with all requirements set forth in Micron's Product Content Specification document, and amendments thereto.
- 9.4.1.2 Suppliers shall provide 100% of chemical substance data, information, disclosures and certifications to support Micron's reporting and regulatory requirements, which may be in addition to local regulatory requirements for Chemical Substance Law. Micron requires 100% disclosure to ensure personnel health and safety analysis.
- 9.4.1.3 Supplier Products shall comply, at a minimum, with Chemical Substance Laws applicable to the Products in the location of manufacture and in every other country and/or jurisdiction where the Products may be sold, distributed, transported, stored, used, recycled, and/or disposed (including where the Products are incorporated in a Micron product). Chemical Substance Laws refers to laws, regulations, orders, directives and policies applicable to the chemical substance content, composition and recyclability of Products in any jurisdiction around the world, including but not limited to: the Restriction of Hazardous Substances Directive ("**RoHS**"), the Toxic Substances Control Act ("**TSCA**"), the Registration, Evaluation, Authorization and Restriction of Chemicals ("**REACH**") and their equivalents ("**Chemical Substance Laws**").
- 9.4.1.4 Supplier must monitor and understand existing and emerging Chemical Substance Laws to ensure that the Products are and remain compliant. Supplier shall provide Micron prompt, written notice of any limitation on Micron's use, storage, distribution, transport, import, export, sale, recycling, and/or disposal of any Products arising under Chemical Substance Laws, including limitations that arise during the expected life of the Product, or within ten (10) years of Supplier's sale of the Product to Micron, whichever is later.
- 9.4.1.5 Supplier shall provide Micron proof of compliance with all Chemical Substance Laws and Micron product content requirements, upon request. Proof of compliance includes but is not limited to: written certifications executed by Supplier verifying compliance, documentation and information relating to the composition and content of the Products and/or testing documentation. At initial qualification and/or upon request by the Micron Product Compliance team or other Micron representative, suppliers shall provide an FMD ("Full Material Declaration") for all homogenous substances making up a specific product. Notification to Micron (through the SCM) of any material composition changes shall be made prior to implementation. Suppliers shall annually provide 3rd party ICP (inductively couple plasma) test reports for all homogenous substances listed in the FMD Bill of Materials ("BOM").
- 9.4.2 Supplier shall act as the importer of record for all Products sold and delivered to Micron.

## 9.5 RoHS and Halogen Free Testing Requirements

- 9.5.1 Suppliers shall provide to Micron chemical analysis reports from a third-party certification unit with ISO/IEC 17025 Laboratory Quality Certification for the RoHS and Halogen substances upon request.
- 9.5.1.1 If you have questions on any Micron Product compliance related topic, please contact a Product Compliance stakeholder at [GSCC\\_Product\\_Compliance@micron.com](mailto:GSCC_Product_Compliance@micron.com).



## 10.0 Supplier Change Management

### 10.1 Supplier Change Notification Requirements

- 10.1.1 Suppliers shall have documented processes or systems implemented for managing internal change as well as managing change notifications from their Sub Suppliers.
- 10.1.2 Unless otherwise agreed upon, Suppliers are required to notify and obtain approval from Micron, utilizing the SCM ("**Supplier Change Management**") process prior to any changes being implemented to procured goods or services being supplied to Micron, as referenced in Micron's Supplier Change Policy.
- Company structure change
  - Manufacturing or site location change
  - Tooling change
  - Process flow/ control change
  - Material or component (BOM) change
  - Conflict Minerals related change
  - Design Change driven
  - Fit, form, or function change
  - Packaging or labeling change
  - Test/Inspection/Metrology change
  - Supplier and/Sub-tier Supplier change
  - End of life (*12 months in advance notification required*)
  - Cost impact
  - Delivery method
  - Fit, form or function change
  - Safety Impact
- 10.1.3 Alternative requirements of notification or approval of changes may be captured in mutually agreed upon specifications. Micron reserves the right to reject any change that requires approval, as detailed in the SCM policy. For any changes that fall outside the above said policy, it is expected that the Supplier use reasonable efforts to notify Micron of any change(s).
- 10.1.4 If there are any questions regarding Supplier Change Management, please contact [CP\\_SQEG@micron.com](mailto:CP_SQEG@micron.com) or [SCN\\_Admin@micron.com](mailto:SCN_Admin@micron.com).



## 11.0 Document Control

- Suppliers are required to maintain all documents that are used or needed for the development, process, testing, qualification, or inspection of manufactured Products in a revision controlled process or system. This process or system should include reasonable document or record retention, change approval, periodic document review, and internal approval/notification criteria for all controlled Product documentation.

## 12.0 Training

- Suppliers are expected to provide periodic training to all personnel that are involved with the manufacturing, inspection, test, and quality assurance of any good or service produced for Micron. Training material for above personnel must be documented and maintained through a formal document control process (i.e. periodic document review, change approval and review workflow).
- Suppliers are expected to maintain certification and de-certification procedures for all personnel involved with the manufacturing of goods or services being procured by Micron. These procedures should include periodic re-certification activities where applicable.



## 13.0 Definitions

- **“Agreement”** shall mean any agreement executed by the parties or the purchase order and any accompanying documents governing Micron’s purchase(s) from Supplier.
- **“Specifications”** shall mean the document or set of documents that are mutually agreed by the parties that describe the Products and all associated requirements for the Products. This may also be referenced as technical specific requirements.
- **“Materials Specification Document”** shall mean the document that defines standard requirements mutually agreed upon by the parties as applicable to the procurement of materials or services. These may be commonly referenced as material/technical specific requirements.
- **“Products”** means the goods and/or services described in the applicable sale/purchase Agreement between Supplier and Micron.
- **“Out of Control Product”** shall mean a condition within a process where the variations among the observed or recorded data values cannot be attributed to random variation.
- **“Non-conforming Product”** is defined as any deviation from baseline process of record (POR). In addition, it can be considered 1) Predicted or observed defectiveness which does not meet the set quality and reliability requirement(s); 2) Material that does not meet the product data sheet specification or customer requirements; or 3) Material which is questionable when it could potentially become discrepant anywhere in the supply line.
- **“Maverick Product”** is defined in EIA/JESD 50 as atypical product exhibiting anomalistic characteristics which cause higher than normal level of failure in the end user application.
- **“Cp”** measures the process capability with respect to its specification using Upper Specification Limit (USL) and Lower Specification Limit (LSL).
- **“Cpk”** a measure of process capability. Measures the process variation with respect to its sample mean, which is also considered to be the process mean.
- **“Backend”** is a reference to those processes contained with the assembly, test, and packaging areas of manufacturing.
- **“Frontend”** also known or referred to as the Fab, is a reference to those processes contained in the wafer fabrication areas of manufacturing.
- **“Direct Materials”** is material that is consumed as part of the production process and becomes part of the product. Also includes those outside services that apply directly to the product such as plating or assembly which is then returned to Micron before becoming a saleable product. (Examples: Wafers, Lead-frames, Molding Compound, Packaging)
- **“Indirect Materials”** Material used to support business operation, equipment operation or the production process, but not as a component of the production process. (Examples: Quartz, Trays, Gloves, paper)
- **“External direct material/service suppliers”** are suppliers to Micron who provide direct material or manufacturing services that directly result in a finished product which is shipped on behalf of Micron Technology, Inc.
- **“Indirect material/service suppliers”** are suppliers to Micron who provide indirect material or manufacturing services to Micron that do not directly result in a finished product which is shipped on behalf of Micron Technology, Inc.



## 14.0 Acronyms

- **“APQP”**: Advanced Product Quality Planning. A structure activity which plans, tracks and reports the development of a process to manufacture a component/material/assembly to meet customer requirements
- **“AIAG”**: Automotive Industry Action Group
- **“BOM”**: Bill of Materials
- **“CFSI”**: Conflict Free Sourcing Initiative
- **“CIP”**: Continuous Improvement Program
- **“CMRT”**: Conflict Minerals Reporting Template
- **“CoA”**: Certificate of Analysis
- **“CoC”**: Certificate of Conformance
- **“EICC”**: Electronics Industry Citizenship Coalition
- **“FMD”**: Full Material Declaration
- **“FMEA”**: Failure Modes and Effects Analysis
- **“G8D”**: Global 8D (“8 Discipline”)
- **“ICP”**: Inductively Couple Plasma
- **“IQC”**: Incoming Quality Control
- **“KMG”**: Key Material Group
- **“MPE”**: Maverick Product Elimination
- **“MRB”**: Material Review Board
- **“NDA”**: Non-disclosure agreement
- **“OCT”**: Operations Central Team
- **“OOC”**: Out of Control
- **“PCN”**: Process Change Notification
- **“PFMEA”**: Process Failure Modes Effects Analysis. A team process that identifies and controls potential failures before the product goes into production
- **“QMS”**: Quality Management System
- **“REACH”**: Registration, Evaluation, Authorization, and Restriction of Chemicals
- **“RoHS”**: Restriction on the use of certain Hazardous Substances
- **“SCM”**: Supplier Change Management
- **“SPC”**: Statistical Process Control
- **“SQN”**: Supplier Quality Notification
- **“SQRD”**: Supplier Quality Requirements Document
- **“STC”**: Ship-to-Control
- **“SVHC”**: Substances of Very High Concern
- **“TSCA”**: Toxic Substances Control Act
- **“WIP”**: Work-in-Process
- **“PPAP”**: Production Part Approval Process. A defined process for the validation of new materials and subsequent process changes.



## 15.0 Reference Material

**NOTE:** Any reference material that is considered or specified as Micron specific may be available upon request, through Micron's Global Procurement department at [CP\\_SQEG@micron.com](mailto:CP_SQEG@micron.com).

- General Supplier Hardware Specification
- Global Quality PPAP Business Rules Standard
- Global BE Capacitor Specification
- Global BE Resistor Devices Specifications
- Global BE Inductor Specification
- Global BE Barcode and Shipping Label Requirements
- Global BE Active Device Specifications
- Global BE Printed Circuit Fabrication Specification
- Global BE MPE Program
- Global BE General Supplier Requirements
- Global BE SSD Connector Specifications for Suppliers
- Global Material Specification Guidelines (Front End)
- Micron Product Content Specification (includes the Supplier/Subcontractor Environmental Compliance Agreement)
- Micron Supplier/Subcontractor Chemical Substance and Material Specification
- Micron Supplier Introduction to SQN
- Micron Supplier Change Management Policy
- [EICC Electronic Industry Code of Conduct](#)
- [CFSI Conflict Free Sourcing Initiative](#)
- Micron Global Procurement Supplier Performance Evaluation Process
- Micron Quality Manual
- AIAG CQI-19, Sub tier Supplier Management Process Guideline
- JEDEC JESD50B.1, MPE
- JEDEC J-STD-046
- ISO 9001:2015 QMS Requirements
- ISO 17025 General requirements for the competence of testing and calibration laboratories
- ISO 14001 Environmental Management Systems Requirements
- OSHAS 18001 Occupational Health and Safety Management Systems Requirements
- IATF 16949 Automotive QMS Standard— Particular requirements for the application of ISO 9001:20015 for automotive production and relevant service part organizations (edition October 2016)
- AIAG Core Tools (FMEA, SPC, PPAP, APQP, and MSA)
- SEMI C64-0308
- Calibration documents