

Skyworks RF Ceramics Supplier Quality Manual

1 Purpose and Scope

1.1 Purpose

The purpose of this manual is to define the basic quality systems and business procedures required for suppliers who currently or potentially manufacture and/or supply production material and / or services to Skyworks RF Ceramics.

This manual also defines quality requirements, business practices and applicable documents for these suppliers, in order to maintain their status as an approved supplier.

This manual, the Commercial Agreement, the Nondisclosure Agreement, and the Skyworks RF Ceramics purchase orders are intended as the agreement on all the terms and provisions. This manual supersedes any prior written or oral agreements concerning any of the subject matter of this manual.

1.2 Scope

This procedure applies to Skyworks RF Ceramics suppliers of Level 1 Materials and Level 4 Services that directly affect the form, fit, function, quality or reliability of the finished product.

2 Acronyms / Terminology and Description / Definition

Approved

The supplier status is such that Skyworks RF Ceramics' Sourcing may buy qualified products from that supplier.

ASL

Approved Supplier List

Certificate of Analysis

Signed document that provides quantitative data for the items being delivered that certifies that the product conforms to all purchase order requirements and, reference specifications.

Certificate of Conformance

Signed document certifying that delivered products conform to all purchase order requirements and reference specifications.

Disqualified

The supplier performance has proven unacceptable such that no further orders may be placed.

Fitness for Use

Product or service that fits Skyworks RF Ceramics' defined purpose, under anticipated or specified operational conditions.

Level 1 Material

Material used in the manufacture of finished product and directly affects the form, fit, function or reliability of the finished product.

Level 4 Service

Service provided by an outside contractor that directly affects the form, fit, function or reliability of the finished product.

RMA

Returned Material Authorization: typically a requirement for returning nonconforming products to the supplier.

SCAR

Supplier Corrective Action Request: formal request for improvement issued by any member of the team.

SQE

Supplier Quality Engineer

Sub Tier Suppliers

Suppliers used by the supplier

3 Associated Documents

Access to Skyworks RF Ceramics documentation can be obtained upon request or generic documentation is available via the Skyworks RF Ceramics [website](#) under Quality.

Skyworks RF Ceramics Documents

RFC-WI-0002	RF Ceramics Supplier Qualification and Monitoring
RFC-F0003	Supplier Procurement Survey
RFC-SOP-0003	RF Ceramics Supplier Sustainability Specification
RFC-WI-0005	Green Procurement Supplier Specification
RFC-SOP-0004	RF Ceramics Supplier Change Notification Agreement

National and International Standards

Referenced in this document and applicable to all suppliers:

ANSI/ESD S.20.20	Development of an Electrostatic Discharge Control Program for Protection of Electrical and Electrical Parts, Assemblies and Equipment
FMEA	AIAG Failure Mode Effects Analysis Manual
ISO 9001	Quality management systems – Requirements
ISO/IEC 17025	General requirements for the competence of testing and calibration laboratories

4 Supplier Qualification

Supplier Qualification is performed per **RFC-WI-0002 Supplier Qualification and Monitoring**. Conformance to these requirements is verified by means of supplier surveys, requested self-appraisals, and if required, on-site assessments performed by Skyworks RF Ceramics or a third party.

4.1 Supplier Performance Monitoring

Supplier performance is monitored monthly based on a demerit system that gives equal weight to quality and delivery. The maximum score is 100%. Suppliers that fall below 70% for three consecutive months are placed on probation and an improvement plan is expected. Suppliers that fail to show improvement may be disqualified.

5 Supplier Expectations**5.1 Corporate Policies and Objectives**

It is the policy of Skyworks RF Ceramics that materials and services used in the design and production of Skyworks RF Ceramics products be procured in a professional and ethical manner that results in achieving the lowest total cost of ownership for Skyworks RF Ceramics and for our customers. Further, all purchased materials and services must be in compliance with agreed upon requirements, be delivered on time, and have competitive lead times and prices.

5.1.1 Confidentiality

Both parties (the Supplier and Skyworks RF Ceramics) will hold in confidence any and all data or information which is received from the other party which is marked CONFIDENTIAL or PROPRIETARY, if disclosed in documentary form, or identified as CONFIDENTIAL or PROPRIETARY at the time of disclosure, if disclosed in other than documentary form.

Should conditions of the effort warrant such an action, the parties will enter into a separate Non-Disclosure Agreement, providing mutual protection regarding the data exchanged between them.

5.2 Regulatory Agency Compliance

It is the supplier's responsibility to ensure that their product is in compliance with all applicable regulatory agency and product safety requirements, and claims including that stated in supplier published product advertising, catalogues and data sheets. The supplier must be prepared at all times to substantiate compliance by providing copies of test reports and making records available for review if requested.

5.3 Sustainability

All requirements set forth in **RFC-SOP-0003 RF Ceramics Supplier Sustainability Specification** apply.

5.3.1 Banned and Restricted Substances

Refer to **RFC-WI-0005 Green Procurement Supplier Specification** for all materials restrictions and reference to Sky-works' banned and restricted substances.

5.4 Risk Management Policy

The supplier shall have an up-to date Risk Management Policy ensuring that in the event of disaster or inability to perform the supplier has a plan to take necessary action in order to minimize and or eliminate such risk from Skyworks RF Ceramics.

5.5 Notification of Product Quality or Delivery Issues

5.5.1 Non-Conforming Product

Delivery of product to Skyworks RF Ceramics not meeting Skyworks RF Ceramics specifications or supplier's internal manufacturing specifications for measurements, as identified on acceptance criteria or Skyworks RF Ceramics specifications requires:

- Supplier to review non-conformance through a cross functional Material Review Board (MRB) to determine acceptability of shipping material to Skyworks RF Ceramics.
- Issuance of a Non-Conforming Material Report (NCMR) to the Skyworks RF Ceramics' Supplier Quality Engineer specifying nature of non-conformance, associated data with non-conformance, and supplier's MRB explanation of why supplier believes the non-conformance will not impact Skyworks RF Ceramics' product performance, quality or yield.
- Approval of the NCMR by Skyworks RF Ceramics Quality Department.

5.5.2 Product / Process Changes

The supplier must notify Skyworks RF Ceramics of changes affecting form, fit, function, and / or reliability as defined in RFC-SOP-0004 Supplier Change Notification Agreement.

5.6 Product Identification

The Supplier shall have a system of manufacturing control such as a traveler, run card, control software, etc., used for the identification of products with regard to type, lot or serial number, and their status during all stages of production and test. The shipments containing finished products shall be labeled according to relevant Skyworks RF Ceramics specifications.

5.7 Product Traceability

The Supplier shall have a system for ensuring finished product traceability back to the subassembly, component and raw materials. Traceability shall be achieved by means of date code, lot and/or serial number.

5.8 Quality Plan

Skyworks RF Ceramics strives to improve its quality and to provide world-class products to our customers. To meet and maintain this objective, Skyworks RF Ceramics expects the following minimum elements to be present with its suppliers:

- Quality System
- Process Controls
- Purchasing Process
- Process Risk Management Plan (FMEA)
- Reliability Assurance
- Corrective and Preventative Action Process
- Document Control System
- Internal Quality Audit System
- Work Environment Conformity
- Problem Resolution, Escalation and Key Contacts

In the event the supplier does not have an element of this plan, Skyworks RF Ceramics will determine if it will assist the supplier in developing the missing element. The Quality plan may be reviewed by the Skyworks RF Ceramics Supplier Quality Engineer prior to a supplier being qualified. For existing suppliers, Skyworks RF Ceramics Quality Engineers may work with the supplier to document and/or develop an acceptable Quality Plan.

5.8.1 Quality System

Suppliers are expected to have an effective quality system in place that assures consistent on-time delivery of conforming product.

- System should be based on **ISO 9001**.
- Calibration and Testing Laboratories shall comply with **ISO/IEC 17025**. The parameter and/or equipment applicable to the laboratory service being provided must be within the scope of accreditation.
- **ANSI/ESD S.20.20** certification is required for assembly and/or test suppliers where applicable.

Note: All third party certificates must include a valid certification body accreditation mark.

5.8.2 Process Controls

The supplier shall plan and carry out manufacturing processes under controlled conditions that shall include:

- The use and development of control plans.
- The use of documented work instructions available at point of use.
- The use of suitable equipment for test, inspection and measurement of Skyworks RF Ceramics product.
- The use of statistical tools such as Statistical Process Control (SPC) and capability studies. The supplier shall initiate a reaction plan for characteristics that become incapable or unstable.
- A production scheduling system that supports Skyworks RF Ceramics' delivery expectations.

5.8.3 Purchasing

The supplier shall have a defined process for its purchasing process that includes:

- The use of approved sub tier suppliers for the procurement of materials and/or services that directly affect the form, fit, function or reliability of Skyworks RF Ceramics products.
- A supplier development program that emphasizes the flow down of the requirement set forth in this manual to sub tier suppliers.
- The generation of purchasing information that clearly describes the product being purchased.
- The implementation of verification activities to ensure that incoming product meets specified purchase requirements.
- Sub tier supplier performance monitoring.

5.8.4 Failure Mode and Effect Analysis (FMEA)

It is strongly recommended that the supplier develop a Process or Product FMEA and use those results to determine the appropriate test and inspection points as well as appropriate control methods. Additional information can be found in the **AIAG FMEA manual**.

5.8.5 Reliability

Suppliers shall have a qualification process for their products, processes and/or components that ensure quality, reliability and fitness for use. This process must be followed for new products as well as product or process changes. This process must also include on-going reliability testing that gathers and monitors reliability data on qualified production products and processes.

Other suppliers may be requested to provide these reports on an as-needed basis.

5.8.6 Corrective Action and Failure Analysis

Skyworks RF Ceramics will use a Supplier Corrective Action Request (SCAR) as the trigger to engage the supplier for a request for containment, root cause analysis, corrective action and verification. All responses from supplier need to be in an 8D or equivalent format. The supplier should have a formal process with evidence that key personnel have been trained. Failure Analysis capabilities and support needs to be identified in the Quality Plan.

The initial response (3D) needs to be provided within 1 business day of the receipt of samples. The root cause analysis and corrective action plan (5D) shall be provided within 10 business days of the receipt of samples. The actual deployment and verification (6D though 8D) may take longer based on the complexity of the problem.

5.8.7 Document Control System

Skyworks RF Ceramics requires suppliers to have a document control system in place. Suppliers must ensure that the latest Skyworks RF Ceramics specifications, work instructions, and other related documents are maintained in this system.

5.8.8 Internal Quality Audits

Suppliers shall perform internal quality audits in accordance with documented procedures and control plans. The supplier shall review audit results, plan corrective action and perform follow-up verification of corrective action effectiveness.

The supplier will publish the frequency of internal audits performed in the supplier facility in the Quality Plan. Periodically, the supplier may be requested to share details of the internal audits and follow-up items with Skyworks RF Ceramics Supplier Quality Engineer.

5.8.9 Work Environment

Suppliers shall determine and manage the aspects of work environment needed to achieve conformity to product requirements. Examples of aspects include but are not limited to temperature, humidity, cleanliness and electrostatic discharge protection.

Suppliers who handle ESD sensitive parts are expected to establish and maintain an ESD management system in accordance with **ANSI/ESD S20.20** (see section 5.8.1).

5.8.10 Problem Resolution, Escalation and Key Contacts

The Quality Plan will also define who has authority for resolving quality, technical and supply issues and the escalation process to the next level of management in the event that a decision cannot be reached at any level.

The supplier is expected to designate a key contact person and will furnish their name, daytime phone number, pager/mobile number and email address. This individual will be the owner for taking action on quality alerts and assuming all reports and corrective action request are rendered to Skyworks RF Ceramics in a timely fashion. The supplier will be responsible for assuring the availability of this individual or that a back-up is available to Skyworks RF Ceramics at all times.

5.9 Reports

When requested, all shipments must be accompanied by a certificate of conformance and/or certificate of analysis traceable back to the delivered items.

The supplier may be requested to provide periodic reports or summary reports of inspection or test results. The Skyworks RF Ceramics Supplier Quality Engineer may review the metrics and reporting formats and frequency. Additionally the supplier may be requested by Skyworks RF Ceramics Supplier Quality Engineer to provide periodic summary reports of FA and evaluation results on SCARs / RMAs. These will need to be in the format prescribed by Skyworks RF Ceramics Supplier Quality Engineer.

5.9.1 Calibration Reports

For calibration service providers, calibration reports must include evidence of conformance to requirements. Calibration shall be performed in accordance with manufacturer's specifications unless otherwise noted on the purchase order. The calibration report shall include as a minimum the following information:

- Equipment identification, including the measurement standard against which the equipment is calibrated
- Any out-of-specification readings as received for calibration/verification
- A statement of conformity to specification after calibration/verification

5.10 Supplier Self-Assessment Survey

RFC-F0003 Supplier Procurement Survey needs to be completed by the supplier during the initial supplier evaluation and will be kept on file by Skyworks RF Ceramics. This form will also be used as the template for on-site audits performed by Skyworks RF Ceramics. An updated survey may be requested by the Skyworks RF Ceramics Supplier Quality Engineer if deemed necessary.

5.11 Capability Indices

The supplier shall establish a procedure to assure that critical Cpks are ≥ 1.33 . This procedure may be reviewed by the Skyworks RF Ceramics Supplier Quality Engineer. For those critical Cpks which are < 1.33 for two consecutive quarters, the supplier will have documented improvement plans that shall be made available to Skyworks RF Ceramics upon request.

5.12 Control of Skyworks RF Ceramics Owned Product or Equipment

Secondary materials (such as carrier tape, trays, packaging, etc.) and consigned material provided or specified by Skyworks RF Ceramics shall be verified to meet Skyworks RF Ceramics requirements and fit for use before being accepted.

Custom equipment and/or tooling purchased by Skyworks RF Ceramics shall remain the property of Skyworks RF Ceramics. All Skyworks RF Ceramics-owned equipment and tools will be marked with Skyworks RF Ceramics' control numbers prior to shipment to the supplier.

Skyworks RF Ceramics owned equipment, tools, test correlation parts, secondary materials, and/ or consigned material shall be controlled, stored, handled and maintained in a manner that protects them from loss and damage.