Quality Assurance Program

Introduction

Lattice Semiconductor Corporation (LSC) views quality assurance as a corporate responsibility and an integral part of all operational activities. LSC's Quality Assurance organization is independent from Manufacturing and has direct access to top management, assuring sufficient authority is afforded to quality issues.

LSC's quality program is in full compliance to the quality assurance requirements of MIL-I-38535B Appendix C and all inspection system requirements of MIL-I-45208. LSC is also fully certified to the ISO 9001 standard.

Reliability

All new products, processes and vendors must pass predefined evaluations before receiving initial qualification release. Major changes to products, processes or vendors require additional qualificaton before implementation. To assure continuing conformance to reliability goals, an ongoing monitor program is maintained on all products.

In-Process Control

Qualified product must be manufactured under strict quality controls that start with regulated procurement and documented inspection plans for all incoming materials. Sample testing and in-line monitoring as well as statistical process control charts provide constant feedback at each critical step of the manufacturing process.

Calibration

All equipment involved in determining product conformance to specifications through inspection, measurement or testing must be of the required accuracy. Equipment is calibrated and maintained on a defined interval against a nationally recognized standard. In addition, equipment must exhibit a suitable indicator showing calibration status as well as safeguards to disallow unauthorized adjustments.

Training

Key manufacturing personnel must complete a formal training program and obtain certification for each operation before they are allowed to perform activities affecting quality. Methods and records identifying the type and extent of training are maintained and recertification required on a yearly basis.

Subcontractor Control

All subcontracted manufacturing operations must be performed by sources exhibiting a quality program commensurate to that of Lattice Semiconductor. Key suppliers are audited at least once a year to monitor their compliance to LSC's quality initiatives and goals. Incoming inspection is performed to provide feedback and continuous improvement of subcontractor performance with the main objective being to control quality at the source. Communications and in-line data are continuously exchanged to allow real-time monitoring of subcontractor manufacturing operations.

Document Control

Every product and process must have adequate written documentation released and available at the point of use before production begins. All information related to the definition, manufacturing, testing and support of LSC products or services shall be maintained and controlled. Initial release as well as subsequent changes must be properly reviewed and approved before implemented.

Nonconforming Material

Material found to be nonconforming to specified requirements is identified, segregated, analyzed and dispositioned per documented procedures. Records are maintained denoting the nature of the discrepancy as well as the final disposition. All dispositions involve the applicable engineering section and Quality Assurance. Where applicable, the root cause of the discrepancy will be identified and a corrective action implemented using the CAR (Corrective Action Request) form.

Failure Analysis

Failure modes discovered during qualification testing, inspections, customer returns or in-process screening are processed through LSC's Failure Analysis group to determine the cause or relevancy of the failure. Verified failure modes are documented and corrective action initiated as required to eliminate the root cause.

Corrective/Preventive Action

All operational functions utilize a documented corrective action system coordinated, recorded and monitored by Quality Assurance. The system is designed to provide for proactive problem identification and resolution in a timely manner. Inputs include vendor, internal and customer related problems. Emphasis is placed on effective elimination of the root cause to prevent recurrence of the problem.

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Management is responsible for ensuring that employees have sufficiently well defined responsibilities, authority and organizational freedom to identify potential quality related problems as well as initiate and implement solutions.

Self Audit

Internal self audits of the entire quality and delivery system are performed per written procedures and to a predefined schedule. The functional audits evaluate actual method to written procedure. The results of these audits are documented on a checklist and any discrepancies are brought to the attention of personnel responsible for the audited area. Deficiencies require corrective actions must be initiated and subsequently verified as to deployment and effectiveness. A periodic review of these functional audit results and corrective actions is performed by Quality Assurance.

Procurement

All direct materials and services affecting quality or reliability of end product must be purchased from qualified sources. Selection of these critical suppliers is based upon one of more of the following: quality system audits, product qualification testing, correlation studies, incoming inspection and demonstrated ability. A qualified supplier list is maintained by Quality Assurance and used by Purchasing to control procurement. Each purchase order must specify the applicable controlling requirements for all such direct materials or services.

LATTICE SEMICONDUCTOR CORPORATION
5555 Northeast Moore Court
Hillsboro, Oregon 97124 U.S.A.
Tel.: (503) 681-0118
FAX: (503) 681-3037
http://www.latticesemi.com

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