QUALITY AND RELIABILITY

General Information

IDT believes that achieving product excellence requires rising above industry norms — being better than our competitors by developing superior designs and manufacturing them with outstanding processes, tight controls and excellent materials. Indeed, higher levels of quality and reliability are hallmarks of IDT products. Among the many techniques we use to ensure product excellence are the following:

- We build Product Reliability into every product design, starting with the initial design conception and continuing to and beyond the final stage of development.
- We build Product Quality into every step of the manufacturing process, verifying it via stringent inspections of incoming materials and reliability conformance checks after critical process steps. We monitor Statistical Process Control (SPC) control charts and Process Capability Indices (Cp and Cpk) at critical phases of production, and apply SPC requirements to our vendors and incoming material.
- We ensure the Product Quality of finished semiconductor devices by making appropriate electrical tests and by performing rigorous final inspections and reliability conformance checks.
- We maintain high Product Reliability by obtaining data from accelerated tests, correlating it with field data from customers, and then generating improvements whenever necessary in our designs, processes or materials.

Product Assurance Documents

IDT uses the MIL-STD-883, MIL-I-38535, STACK-0001, EIA/JEDEC and IPC (Institute for Printed Circuits) standards as baseline documents in the development of our test methods, procedures and general specifications for semiconductors.

IDT Mission Statement

IDT creates vital semiconductor solutions to accelerate innovation by our customers. IDT products accelerate packet processing in core, metro, access, enterprise, small office/home office (SOHO) and wireless products that deliver advanced network services. We excel at integrating processors, logic, PLLs and memory into high-quality, reliable silicon that enhances network performance, bandwidth and quality of service (QoS); minimizes system downtime; and shortens the time to market for leading communications infrastructure companies.

The diverse products we produce include industry-leading network search engines, programmable content inspection engines, flow-control management devices, Interprise™ integrated communications processors and switching ICs, as well as FIFOs, multi-ports, timing solutions, telecommunications ICs, high-performance digital logic and high-speed SRAMs.

What is Quality at IDT?

Quality at IDT is a top-level goal. We aim to provide competitively priced products that offer greater levels of quality and reliability than similar products from other suppliers. As a result, quality comprises a commitment to excellence, a pledge to customers, a company-wide attitude of continuous diligence, a process of always striving to make meaningful improvements, and a corporate culture that is driven to meet or exceed the highest applicable standards.

Quality Objectives

At IDT, quality and reliability objectives encompass all our activities. Those objectives start with strong support from top management and extend to a determination to deliver exceptional customer service long after we ship our products.

Our corporate philosophy emphasizes that quality and reliability must be built into all of our products, so we encourage all employees to be unceasingly dedicated to quality. The result is an IDT culture of quality that comprises the following aspects and more:

- Structured training programs for our wafer fabrication, test, process control personnel and supporting organizations
- Team-based problem solving methodologies
- Quality philosophy, statistical methods (company-wide training)
- Stringent in-process inspections, gates, and monitors
- Rigorous qualification and evaluations of designs, materials, and processing procedures
- On-going reliability monitors and process verifications
- Real-time statistical process control methods
- Company-level audits of manufacturing, subcontractors, and suppliers
- Control of non-conforming material
- A robust corrective-action system modeled after the 8D (Eight Discipline problem solving) principles, with a strong focus on verification and follow-through for permanent systematic solutions

CUSTOMER FOCUSED QUALITY ASSURANCE SYSTEMS

Customer Interface

Product Quality Assurance seeks to understand our customer's requirements early in the business relationship. Shortly after the initial sales contract, Product Quality Assurance becomes the contact point for reviewing reliability and quality requirements.

Customer Requirement Review

Customer specifications, channeled through the IDT sales, customer service and quality assurance organizations, are reviewed and compared to our internal standards. Any areas of incongruity are noted and dialogues are established with appropriate customer personnel to resolve the differences. Contracts are reviewed and modified to reflect necessary changes.

Product Verification, Design Reviews and Process Change Notifications

Product Quality Assurance helps verify the quality of new product designs at various stages of the development process. This group also assists in the qualification of the process technologies and manages Process Change Notifications (PCNs).

RELIABILITY

Reliability Program

A primary objective at IDT is to improve the reliability of our products through the characterization and enhancement of our manufacturing operations. We strive to quickly identify any specific failure mechanisms that occur in the wafer fabrication and assembly processes. This information initiates corrective actions that reduce defects and help maximize product quality and reliability.

Qualification

The ultimate goal of the IDT qualification process is to ensure high levels of quality and reliability that contribute to customer satisfaction. We periodically review the qualification criteria we use to maintain consistency with quality requirements. Extensive qualification testing and data collection verifies that all new product designs, processes, and packaging configurations meet the absolute maximum ratings of design, as well as the worst-case performance criteria for end users.

Product Monitors (Ongoing Reliability Monitors)

IDT operates a program that randomly selects a statistically significant sample of production products, then subjects them to maximum stress test levels. Data from this testing is used to evaluate the useful life of the products in field-use environments.

Failure Analysis

The failure analysis function is an integral part of the Quality and Reliability department at IDT. The highly technical experts in our sophisticated failure analysis laboratory provide visual analysis, electrical reject mode analysis, and both destructive and non-destructive data. That data is then used to develop corrective actions for improving our designs and processes.

Wafer-Level Reliability Program

Wafer-level testing is part of the continuous improvement approach that IDT implements. It produces reliability data that provides early warnings of undesirable process variations and anomalies. We use the test data to improve our manufacturing process; identify potential problems and issues before they become serious; determine the sources of any process weaknesses; and eliminate problems upstream in the process.

Driving the IDT wafer-level test program is the fact that our focus on reliability improvement goes well beyond merely determining the projected lifetime of a product. Our efforts encompass the detailed characterization, measurement and control of the specific parameters that determine the longevity of products.

Electrostatic Discharge (ESD)

IDT recognizes that it is vital to protect devices that are sensitive to Electrostatic Discharge (ESD) from damage caused by electrical transients and static electricity. We incorporate ESD-safe procedures throughout all operations that come in contact with such devices. We have an ongoing initiative to raise ESD protection levels by incorporating increasingly robust protection devices in circuit designs and by making work-area enhancements.

We apply many ESD protection measures, the most basic of which are the following: parts are handled at static safe-guarded workstations; wrist straps are worn during all handling operations; conductive lab coats are used in all testing and all parts-handling areas; and devices are packaged in conductive or anti-static containers.

At IDT, we recognize that many customers want their suppliers to have a certified Quality Systems Management program. We aim exceed expectations by continually driving improvements beyond the minimum requirements.

CURRENT CERTIFICATIONS

Certifications: ISO-9001 Rev 2000

Corp. Santa Clara, California facility	ISO-9001-rev-2000 certified	U.L.	2001
Salinas, California facility	ISO-9001-rev-2000 certified	U.L.	2001
Hillsboro, Oregon facility	ISO-9001-rev-2000 certified	U.L.	2001
Penang, Malaysia	ISO-9001-rev-2000 certified	U.L.	2001
Manila, Philippines	ISO-9001-rev-2000 certified	U.L.	2001

Certifications: ISO-14001 Rev 96

Corp. Santa Clara, California facility	ISO-14001-rev-96 certified	U.L.	1999
Salinas, California facility	ISO-14001-rev-96 certified	U.L.	1999
Hillsboro, Oregon facility	ISO-14001-rev-96 certified	U.L.	1999
Penang, Malaysia	ISO-14001-rev-96 certified	U.L.	2000
Manila, Philippines	ISO-14001-rev-96 certified	U.L.	2000

STACK Self-Audit Certified:

Corp. Santa Clara, California facility	STACK Self-Audit certified	1999
Salinas California facility	STACK Self-Audit certified	1999
Hillsboro, Oregon facility	STACK Self-Audit certified	1999
Penang, Malaysia	STACK Self-Audit certified	1999
Manila, Philippines	STACK Self-Audit certified	1999

Certifications: QML (Military Qualified Manufacturer List):

Corp. Santa Clara, California facility	QML	certified	DSCC	1998
Salinas, California facility	QML	certified	DSCC	1998
Hillsboro, Oregon facility	QML	certified	DSCC	1998
Penang, Malaysia	QML	certified	DSCC	1998

STACK Level-1 and Level-2 Certified:

Corp. Santa Clara, California facility	STACK-Level-1 and 2 certified	1994
Salinas, California facility	STACK-Level-2 and 2 certified	1994

Customer Recognition Awards:

Lucent Technologies	Strategic Supplier	2001
Agere Systems	Top Ten Supplier	2001
Northrop Grumman Electronic Systems	Silver Preferred Supplier	2001
NEC	Best Supplier	1999
STACK	Bronze Award (Supplier of the Year)	1999
Raytheon Electronics Systems	Vendor of the Year	1996
Hamilton Standard	Certified Supplier	1995
Data General	World Class Performance Award	1995
Power Macintosh	Outstanding Performance Award	1995
Dataquest	European Niche Vendor of the Year	1994
ANAM/AMKOR	Plaque of Appreciation	1993
Delco Systems Operations	Supplier Certification Award	1992