	Title: Quality Manual	Doc. No. QM 8001	Date of Issue: Feb 28, 2004	QA Stamp
	Department or Process: Management	Revision 8	Change Effective Date: Sep 25,2012	Confidentiality Business Use Only

Page 1 of 20


AVNET Asia Programming Center

ISO 9001:2008 Quality Manual

For

Employees & Customers


Rev.	DCR#	Date	Originator	Reason for Change	Change Detail
0	HKDCR0 388	28/02/04	Sandy Lim	Initial Release	. Changes History table include DCR# . Revision # align to run from 0
1	HKDCR0 588	01/03/04	Sandy Lim	. Review and Update the Responsibility, Authority & Interface Matrix	. Specify the Head of Organization . Specify the Head of Department & Functions
2	HKDCR0 688	30/03/04	Sandy Lim	Review and update the Quality Manual	Delete customer names & Update the key contact Chan to Chan K H and added in new phone numbers in page 4. Change head of organization title from director to director or V.P in page 19. Change operation mode from 2 shifts to 3 shifts in page 4
3	HKDCR0 803	03Mar08	Sandy Lim	Update the operation mode	Change operation mode from 3 shifts to 4 shifts in page 4
4	HKDCR0 90501-1	01May09	Victor Chan	Update the operation information	Change operation mode from 4 shifts to 3 shifts in page 4 Key Officers update Organization Structure updated Change version to 2008
5	HKDCR0 10610-2	01Jun10	Victor Chan	Update the operation mode	Change operation mode from 3 shifts to 4 shifts in page 4
6	HKDCR2 51010	25Oct10	Victor Chan	Change the clause 8.5.2 & 8.5.3	Update the clause 8.5.2 & 8.5.3 to fulfill ISO9001:2008 requirement
7	HKDCR 2011-001	01Aug11	Victor Chan	Update the operation mode	Change operation mode in page 4 Update minor wordings Review and Update Quality Responsibility, Authority & Required Competency Update the background in page 4 & 5
8	HKDCR2 013-043	24Sep2012	Jeffrey Tai	Update SGPC company name Update SGPC function	Change Avnet Logistics Pte Ltd to Avnet Asia Pte Ltd. Update 7.2.1 (b)

 Reach Further™	Title:	Doc. No.	Date of Issue:	QA Stamp
	Department or Process:	Revision	Change Effective Date:	Confidentiality
	Quality Manual	QM 8001	Feb 28, 2004	
	Management	8	Sep 25,2012	Business Use Only

Page 2 of 20

Table of Content

No.	Page No.	Paragraph No.	Subject Title	ISO 9001:2008 Clause No.
1	1	–	Cover Page	–
2	2	–	Table of Content	–
3	3	–	Quality Policy Statement	–
4	4-5	–	Avnet Asia Programming Center - Background	–
5	6	1.0	Purpose	–
6	6	2.0	Scope	–
7	6	3.0	Reference Document	–
8	6-8	4.0	Quality Management System	4
9	6	4.1	Quality Management System Planning	4.1
10	6	4.2	Documentation	4.2
11	6-7	4.2.1	General Requirement	4.2.1
12	8	4.2.2	Quality Manual	4.2.2
13	8	4.2.3	Document Control	4.2.3
14	8	4.2.4	Control of Records	4.2.4
15	9–10	5.0	Management Responsibility	5
16	10–11	6.0	Resources Management	6
17	11–14	7.0	Product Realization	7
18	11	7.1	Product Realization Planning	7.1
19	11–12	7.2	Customer Related Process	7.2
20	12	7.3	Design and Development	7.3
21	13	7.4	Purchasing	7.4
22	13–14	7.5	Production and Service Provision	7.5
23	13	7.5.1	Control of Production and Service Provision	7.5.1
24	13	7.5.2	Validation of Processes for Production & Service Provision	7.5.2
25	14	7.5.3	Identification & Traceability	7.5.3
26	14	7.5.4	Customer Supplied Product	7.5.4
27	14	7.5.5	Product Preservation	7.5.5
28	14	7.6	Control of Monitoring and Measuring Devices	7.6
29	15–16	8.0	Measurement, Analysis and Improvement	8
30	15	8.1	General Requirement	8.1
31	15	8.2	Monitoring and Measurement	8.2
32	15	8.2.1	Customer Satisfaction	8.2.1
33	15	8.2.2	Internal Quality Audit	8.2.2
34	15	8.2.3	Monitoring and Measurement of Processes	8.2.3
35	15	8.2.4	Monitoring and Measurement of Product	8.2.4
36	15–16	8.3	Control of Nonconforming Products	8.3
37	16	8.4	Analysis of Data	8.4
38	16	8.5	Improvement	8.5
39	16	8.5.1	Continual Improvement	8.5.1
40	16	8.5.2	Corrective Action	8.5.2
41	16	8.5.3	Preventive Action	8.5.3
42	17	Annex A	Avnet A.P.C. Quality Management System Process Plan	4.1, 4.2.2, 5.4.2
43	18	Annex B	Quality Management System Organization Structure	5.5.1
44	18	Annex B	Responsibility, Authority & Interface Matrix	5.5.1
45	19/20	Annex C	Quality Responsibility, Authority & Required Competency	5.5.1, 6.2, 6.6.2

	Title: Quality Manual	Doc. No. QM 8001	Date of Issue: Feb 28, 2004	QA Stamp
	Department or Process: Management	Revision 8	Change Effective Date: Sep 25,2012	Confidentiality Business Use Only

Page 3 of 20

Quality Policy Statement


Each Avnet employee will **provide defect-free services and products that fully meet established requirements to our internal and external customers, and is committed to continually improve the effectiveness of the Quality Management System.**

We will achieve this through the **process of defining and understanding as well as agreeing and conforming, to customer requirements.**

Vice-President of Operations
(Programming Center)

Center Manager
Programming Center

Sr. Director, Quality Assurance/
Management Representative

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 4 of 20

AVNET Asia Programming Center Background

Establishment & **HK - APR 2004**

Official Commencement: **SG – OCT 2002**

SH – DEC 2004

Official Opening by: **President, Avnet Electronics Marketing Asia**

Business Activity: **Device Programming Services**

Operation Mode: **Up to 4 Shifts, as needed**

Capabilities:

Programming Services

- Available Expedited Production Service**
- 24 Hour First Article processing**
- Automated Device Handling**
- Test Vector Generation**
- Customer Serialization**
- Laser Marking**
- Polyester or Kapton Labeling**
- Tape and Reel Packaging**

Device Types Supported

Flash Memory, μ -Controller, EPROM, EEPROM, PROM, Serial PROM, PLD, CPLD, EPLD, FPGA

Package Types Supported


DIP, SDIP, PLCC, LCC, TSOP, PGA, QFP, TQFP, SOIC, SSOP, BGA, μ -BGA

Equipment

- BP Programmers**
- Data I/O Programmers**
- Hi-Lo Programmers**
- System General Programmers**
- Micro Motion Taping Machine**
- High & Low Temperature Labeling**
- Handlers – tube-to-tube, tray-to-tray, tube-to-tray**
- I.C. Serialization Programming**
- Manual Tape and Reel machine with 2D scanner integration**
- Tape and Reel Peel Tester**

Operating Work Environment

ESD Control Practice, 30--65% Ambient R.H., 20--28°C Ambient Temperature

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 5 of 20

Key Officers:

Douglas Adams, Sr. V.P., Global Programming,

Email: Douglas.Adams@Avnet.com

John Alden, Sr. Director, Quality Assurance,

Email: John.Alden@avnet.com

HK - Victor Chan, Programming Center Manager,

Email: victor.chan@avnet.com

SG – John Tan, Programming Center Manager,

Email: John.Tan@Avnet.com

SH – Tom Yu, Programming Center Manager,

Email: Tom.Yu2@Avnet.com

Contact Address:

Hong Kong Office:

**5/F., Tsuen Wan Industrial Center, 220-248 Texaco Road, Tsuen Wan, N.T.
Hong Kong.**

Contact Telephone: +852 - 3583 3803

Contact Fax: +852 - 3583 3800

Singapore Office:

Avnet Asia Pte Ltd, No. 2 Aljunied Avenue 1, #03-01/02, Singapore 389977

Contact Telephone: +65.6867.8130


Contact Fax: +65.6867.8135

Shanghai Office:

**Block 16-3B, No. 69 Xi Ya Road, Waigaoqiao Free Trade Zone, Pudong,
Shanghai, P.R.China**

Contact Telephone: +86-21-50461502

Contact Fax: +86-21-50461990

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 6 of 20

1.0 PURPOSE

1.1 This Quality Manual document and define the Quality Management System covering Quality Policy, quality commitment, organizational quality structure, quality responsibility and authority of personnel, deployed, understood, implemented, and maintained at all levels of Avnet Asia Programming Center Operations.

2.0 SCOPE

2.1 This Quality Manual is applicable to production programming service activity and all departments of Avnet Asia Programming Center Operation applying the 8 Principles of Total Quality Management System to ensure processes and products satisfy requirements and ISO 9001:2008 Quality Management System Requirement Standard.

3.0 REFERENCED DOCUMENTS

- 3.1 ISO 9001:2008 – Quality Management Systems Requirements
- 3.2 ISO 19011:2002– Guidelines for Auditing Quality Systems
- 3.3 ISO 10012 – Quality Assurance requirements for measurement system.

4.0 QUALITY MANAGEMENT SYSTEM

4.1 Avnet Asia Programming Center establishes, documents, implements, maintains and continually improves a Quality Management System meeting ISO 9001:2008 Quality Management System Standards requirements and as a means of ensuring that product conforms to Specified requirements.


The quality management system is described in Annex A of this manual and contains the following;

- a) processes needed, sequence, interaction and their application throughout Avnet Asia Programming Center
- b) reference procedures that describe management activities, availability of resources needed, information criteria, and methods for implementation, necessary to ensure effective operation, control, monitoring, measure, analyze to achieve planned results and continual improvement of these processes in accordance with the requirements of ISO 9001:2008 Quality Management System Requirements Standard.
- c) Processes which are out-sourced for the Programming center activities are controlled by purchasing activities. Refer to 7.4 Purchasing

4.2 Documentation requirements

4.2.1 Avnet Asia Programming center 's quality management system documentation comply to ISO 9001:2008 QMS Standard organized into a four (4) tier hierarchical structure that consist of


- + first level quality manual (QM8001, incorporating quality policy statements),
 - + second level quality management system process procedures,
 - + third level plans, instructions, and forms detailing specific tasks of an activity of a process to ensure consistent process output meeting quality objectives,
 - + fourth level records (incorporating quality objectives statements) demonstrating the effective execution of the quality system and/or satisfying customer requirements.
- a) Quality management system procedures, plans, operating instructions and records are formally documented, effectively implemented and maintained. The range and detail of the procedures are dependent on the complexity of the work, the methods used, and the skills and training needed by personnel involved in carrying out the activity.
 - b) Reference Avnet Asia Programming center's Quality Management Systems Procedures supporting ISO 9001:2008 Q.M.S. Standard is referenced in the Annex 1 and as outlined in the following table:

 AVNET [®] Reach Further™	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 7 of 20

Table 1 : Cross Reference of ISO 9001:2008 Quality Management System Requirements to Quality Manual QM8001 and Quality Management System Procedures (QMSP)

Clause No.	Quality Management System Requirement Subjects	QM 8001 Ref.	QMSP No.
4	Quality Management System	4.0	--
4.1	Quality Management System Planning	4.1	--
4.2	Documentation	4.2	--
4.2.1	General Requirement	4.2.1	--
4.2.2	Quality Manual	4.2.2	--
4.2.3	Document Control	4.2.3	QMSP 4
4.2.4	Control of Records	4.2.4	QMSP 4
5	Management Responsibility	5.0	QMSP 5
6	Resources Management	6.0	QMSP 6
7	Product Realization	7.0	--
7.1	Product Realization Planning	7.1	QMSP 7
7.2	Customer Related Process	7.2	QMSP 7
7.3	Design and Development	7.3	Not Applicable
7.4	Purchasing	7.4	QMSP 7
7.5	Production and Service Provision	7.5	QMSP 7
7.5.1	Control of Production and Service Provision	7.5.1	QMSP 7
7.5.2	Validation of Processes for Production & Service Provision	7.5.2	QMSP 7
7.5.3	Identification & Traceability	7.5.3	QMSP 7
7.5.4	Customer Supplied Product	7.5.4	QMSP 7
7.5.5	Product Preservation	7.5.5	QMSP 7
7.6	Control of Monitoring and Measuring Devices	7.6	QMSP 7
8	Measurement, Analysis and Improvement	8.0	--
8.1	General Requirement	8.1	QMSP 8
8.2	Monitoring and Measurement	8.2	QMSP 8
8.2.1	Customer Satisfaction	8.2.1	QMSP 8
8.2.2	Internal Quality Audit	8.2.2	QMSP 8
8.2.3	Monitoring and Measurement of Processes	8.2.3	QMSP 8
8.2.4	Monitoring and Measurement of Product	8.2.4	QMSP 8
8.3	Control of Nonconforming Products	8.3	QMSP 8
8.4	Analysis of Data	8.4	QMSP 8
8.5	Improvement	8.5	QMSP 8
8.5.1	Continual Improvement	8.5.1	QMSP 8
8.5.2	Corrective Action	8.5.2	QMSP 8
8.5.3	Preventive Action	8.5.3	QMSP 8

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 8 of 20

4.2.2 Quality Manual


- a) This quality manual establishes the scope of Avnet Asia Programming Center quality management system that includes summary of the Center's activities.
- b) Any exclusion and its justification are stated in the relevant paragraphs.
- c) Documented procedures established for the quality management system is referenced in the table above and Annex 1 and will be maintained and updated.
- d) The interaction between the processes of the quality management system is described in Annex 1.

4.2.3 Control of Documents

- a) Avnet Asia Programming Center establishes and maintains a documented procedure to control all related documents to ensure the effectiveness quality management system processes outputs including, applicable documents of external origin such as customer/suppliers/regulatory requirements, standards, procedures, product realization and testing software. Documents may be hard copy or electronic media formats.
- b) Documents for continual implementation and their subsequent changes are reviewed and approved for adequacy by authorized designated functions/organizations staff prior to issue. Pertinent background information is provided to authorizing staff upon which their review and approval is based on. The nature of changes, where practicable, are identified in the updated document or the appropriate attachments in revision history.
- c) Master lists of documents for implementation is maintained to identify the documents current revision status, thus, to preclude the use of invalid and/or obsolete documents and is readily available at designated document controller.
- d) Documents are controlled ensuring that:
 - i. Legible and relevant updated versions of applicable documents are available and maintained at all locations where operations essential to the effective functioning of the quality system is performed,
 - ii. Invalid and/or obsolete documents are promptly removed from all points of issue or use, or otherwise identified of its invalid/obsolete status or retained in identified file for historical, legal and/or knowledge preservation purpose.
 - iii. The quality management system procedure for control of documents is as specified in Table 1 above.

4.2.4 Control of Quality Records

- a. Avnet Asia Programming Center establishes control of quality record procedure as specified in Table 1, use and maintain quality records, including applicable quality records from suppliers, to demonstrate conformance to specified requirements and effective operation of the quality management system. Quality records are in the form of hard copy and / or electronic media.
- b. All Quality records retained are legible, identified, collected, stored over retention times in such a way that they are readily identifiable protected from damage, loss or deterioration and retrievable through adequate indexing, access and filing, disposed and is maintained in a quality record master list.
- c. When contractually specified by the customer, quality records are made available to the customer or the customer's Representative for evaluation for an agreed period.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 9 of 20

5.0 MANAGEMENT RESPONSIBILITY

5.1 Management commitment

Top management is committed to the development and implementation of the quality management system and continually improving its effectiveness as evidenced by

- a) Communicating to employees on the importance of meeting customer as well as statutory and regulatory requirements,
- b) establishing the Avnet's quality policy,
- c) establishing Avnet's quality objectives,
- d) conducting management reviews, and
- e) ensure the availability of resources to meet quality objectives, product and services to assure customer satisfaction.

5.2 Customer focus

To enhance customer satisfaction, top management determines customer requirements and met.

5.3 Quality policy

Avnet Asia Programming Center quality policy is defined on page 3 of this manual by its top management whose content is appropriate to the purpose of the Center and includes a commitment to comply with requirements and continually improve the effectiveness of the quality management system.

- a) **Quality Policy** is communicated and understood within the center is reviewed for continuing suitability at least annually and is deployed by establishing and reviewing quality objective performances.

5.4 Planning

5.4.1 Quality objectives

Top management plans and establishes quality objectives that are measurable and consistent with the quality policy, meeting requirements product and quality management system at relevant functions and levels within the Center. The quality objectives are reviewed annually and revised as appropriate during the year and is documented in the management Review Minutes of the Center. Performances to objective that do not meet objectives are planned with actions for implementation in order to achieve the objective set.

5.4.2 Quality management system planning

- a) The Center's Quality Management System Plan as outlined in Annex A of this Quality Manual defines basic processes, interface / interactions required to satisfy the requirements of the ISO 9001:2008 quality management system standard, quality policy, quality objectives and customer satisfaction.
- b) When changes to the quality management system are planned and implemented, the integrity of the quality management system is maintained to ensure continued or enhanced compliance to ISO 9001:2008 quality management system standard, quality policy, quality objectives and customer satisfaction.


5.5 Responsibility, authority and communication

5.5.1 Responsibility and authority

The responsibilities and authorities for the Quality Management System as documented in this manual is defined in Annexes B and C and is communicated within the Center through controlled document distribution by Document Control Center.

5.5.2 Management representative

- a) The Center's Management Representative is Avnet Asia Programming Center's Manager, appointed Head of Operations for Programming Center who is in-charge of the Programming operation globally.
- b) The Management Representative established, implemented and maintained processes of quality management system needed to meet ISO 9001:2008 and customer requirements. He / She reports the performance of the quality management system, any need for improvement to Center's top management, and ensures the promotion of awareness of customer requirements throughout the organization.
- c) The Management Representative also liaison with external parties on matters relating to the quality management system.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 10 of 20

5.5.3 Internal communication

The effectiveness of the quality management system is communicated to staff and employees of the company in management review meetings, memorandums and notice board displays and briefings

5.6 Management review

5.6.1 General

Avnet Asia Programming Center Top management consisting of Heads of Functional Department reviews the organization's quality management system, at least annually, to ensure its continuing suitability, adequacy and effectiveness. This review assesses Avnet's quality policy and quality objectives results of internal quality audits performed and preventive measures including opportunities for improvement and the need for changes to the quality management system. The Management Representative maintains records of management reviews.

5.6.2 Review input

The inputs to management review include information on

- a) Results of audits,
- b) Customer feedback,
- c) Process performance and product conformity,
- d) Status of preventive and corrective actions,
- e) Follow-up actions from previous management reviews,
- f) Planned changes that could affect the quality management system and
- g) Recommendations for improvement.

5.6.3 Review output

The outputs from the management review include decisions and actions related to

- a) Improvement of the effectiveness of the quality management system and its processes,
- b) Improvement of product related to customer requirements, and
- c) Resource needs.

6.0 RESOURCE MANAGEMENT

6.1 Provision of resources

In order to implement and maintain the quality management system and continually improve its effectiveness, and to enhance customer satisfaction by meeting their requirements Avnet Asia Programming Center provide appropriate human, infrastructure and work environment resources needed to enable the product programming servicing activities.


6.2 Human resources

6.2.1 General

Competent personnel based on appropriate education, training, skills and experience are assigned to perform work affecting product quality.

Their responsibility and authority and interrelationship to manage, perform and verify work include;

- i. initiate action to prevent occurrence of nonconformity, identify and record any problems, initiate and recommend or provide or verify the implementation solutions through designated channels, relating to product, process and quality system; or
- ii. control further processing, delivery, or installation of nonconforming product until the deficiency or unsatisfactory condition has been corrected.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

6.2.2 Training, awareness and competency

- a) Avnet Asia Programming Center determines the necessary competence for personnel performing work affecting product quality (see annex C), provide training or appropriate actions to satisfy the identified competencies that include awareness of the relevance and importance of their activities and how they contribute to the achievement of the quality objectives.
- b) The effectiveness of the training and actions is evaluated through testing, job performance review, quality audits, management review of performances of quality management processes or tasks executed by the assigned personnel meeting process or job quality objectives, as appropriate.
- c) Records of training including education, training, skills and experience are maintained in as listed on the Quality Records master list.

6.3 Infrastructure

- 6.3.1 Infrastructure needed to achieve the conformity to product requirements such as buildings, workspace and associated utilities, process equipment (both hardware and software), supporting services (such as transport or communication), are determined and identified in quality plan and the relevant procedures or documents supporting the product realization.
- 6.3.2 The identified infrastructure is provided, tracked and maintained so as to ensure availability and satisfactory performance of work related to quality.

6.4 Work environment

- 6.4.1 Avnet Asia Programming Center programming activities require an Electrostatic Discharge (ESD), clean and temperature and humidity controlled environment to achieve conformity to product requirements.
- 6.4.2 The work environment needed is managed through scheduled monitoring and preventive maintenance checks with records maintained.

7.0 PRODUCT REALIZATION


7.1 Planning of realization processes

- 7.1.1 The Center plans and develops the processes needed for product realization and documents the planning output as a quality plan. The quality plan incorporates or references relevant requirements of the other processes of the quality management system.
- 7.1.2 The quality plan includes the following:
 - a) quality objective/purpose of each process, features and requirements for the product including those which contain a subjective element;
 - b) Identification for acquisition, preparation, implementation and set up of compatible production programming processes, (including inspection and test equipment), other production processes, applicable documentation for processes, inspection and testing, resources such as work space, equipment, fixtures, work environment, and personnel competency needed to achieve the required product quality for the specific to the product;
 - c) Identification of required / suitable verification, validation, monitoring, quality control, inspection and test activities, techniques and new instrumentation standards for product acceptability at appropriate stages in the realization of product specific to the product and the criteria for product acceptance;
 - d) records needed to provide evidence that the realization processes and resulting product meet requirements.

7.2 Customer-related processes

7.2.1 Determination of requirements related to the product

- a) Avnet Asia Programming Center serves Avnet Sales and Marketing Division which is an internal customer responding to their orders specified in the material resource planning schedule requirement as received from the company's network.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25, 2012	<i>Confidentiality</i> Business Use Only

- b) Customer requirement identification - Avnet Sales and Marketing Division requires specific integrated circuits devices be "purchased" from Avnet Logistic Division warehouse stock and then programmed with end customer provided software program using compatible integrated circuits programming equipment and fixtures, pack with identification into standard packed quantities.

Hong Kong and Shanghai Programming Centers:

The programmed integrated circuit is delivered (returned) to the Avnet Logistics divisions warehouse for storage and shipment, if not immediately shipped. These centers do not warehouse or ship components.

Singapore Programming Center:

The Singapore programming center may store integrated circuits and ship finished goods, but does not warehouse finished goods.

All Programming Centers:

The programming center does not interface with the end customer on orders, procurement of specific integrated circuits, or their delivery. This is a function of the programming centers internal customer, customer service.

- c) Requirements not stated by the customer but necessary for specified or intended use, where known - As integrated circuits are susceptible to ESD damage before, during and after programming, ESD prevention must be practiced in production and tested after programming. ESD protective packaging is necessary for accepted products and ESD with moisture barrier capability packaging is required for moisture sensitive integrated circuit devices.
- d) There is no statutory and regulatory requirement applicable to the product for activities performed by the Programming Center.
- e) Any additional requirement determined by the Programming Center or from customer for specific device or order will be stated in the traveler for compliance.

7.2.2 Review of requirements related to the product

- a) Before the acceptance of an order from Avnet Sales and Marketing Division a review is performed by Planning Coordinator of the Programming Center to ensure that;
- i. for production orders, only orders of customer approved parts are accepted for programming and the part and program required is correct and in accordance to approved product list.
 - ii. any discrepancy in production orders received are resolved with Avnet Sales and Marketing Division. Products Orders not on the approved product list will be resolved with Engineering and Sales and Marketing Division.
 - iii. Programming Center is capability to meet the requirements on order.
- b) Records of order review and schedule or resolution of actions arising from the review are maintained.
- c) Undocumented orders will be confirmed of the requirements by email or fax by the planning coordinator.
- d) When a change to a product requirement is made the traveler will include the amendment for minor changes to enable communication to production for implementation or in the case of a major change, Engineering will be informed to resolve the requested change with Customer.


7.2.3 Customer Communications

The Center communicates effectively arrangements with Avnet Sales and Marketing Division or user customer when required through email, faxes or telephone call in relation to;

- a) approved products for production,
- b) Inquiries, contracts or order handling, including amendments, and
- c) customer feedback, including customer complaints. In the case of customer complaints this will be handled according to QMSP 8.

7.3 Designs and Development

- 7.3.1 The Avnet Asia Programming Center provides programming service of off-the-shelf programmable integrated circuit (i.c.) component using customers' developed programs supplied to us. Thus, this requirement is not applicable as there is no design activity involved in such integrated circuits programming service.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 13 of 20

7.4 Purchasing

7.4.1 Purchasing control

- a) Avnet Asia Programming Center ensures that purchased product and/or services conforms to purchase requirements specified, controlling suppliers and supplies by evaluation, selection and periodical review of suppliers of their ability to supply products that meets quality requirements including quality system and any specific quality assurance requirements. Criteria is based on the satisfactory quality audit reports of quality management system implementation or 3rd party certified quality management system and/or quality records of the previously demonstrated capability, supplier's approval by customer, performance history of acceptable quality performance.
- b) This control is dependent upon the type of products and it's on subsequent product realization of the final product
- d) Records of supplier's evaluations and any necessary actions arising from the evaluation are maintained.

7.4.2 Purchasing information

- a) Purchase documents are reviewed, approved before issuing to suppliers (external suppliers with Purchase Orders, whilst to internal supplier, store, with material requisition) to ensure that purchased information clearly describing the product to be ordered such as:
 - i) Product description (part numbers or applicable issues of specifications, drawings, title and other relevant technical data) and as appropriate,
 - ii) requirements specified in quality survey/audit that included quality management system, approval or qualification of product, process/process equipment, procedures/inspection instructions, and specific personnel qualification requirements as applicable and needed by Avnet Asia Programming Center.
- b) For standard off-the-shelf product, which have been approved and included into the Approved vendor list, purchases ordered by electronic media are reviewed by buyer for correct part required prior to release.

7.4.3 Verification of purchased product

- a) Externally purchased products are inspected to ensure specified purchase requirements are met. Products purchased from Avnet logistic store are verified of correct parts before use for programming.
- b) When Avnet Asia Programming Center or her customer requires verifying purchased product/services at the supplier/subcontractor, Avnet purchasing documents specify these verification arrangements and the method for release of product in the purchase order or fax or email to suppliers.

7.5 Production and service provision

7.5.1 Control of production and service provision

Avnet Asia Programming Center provides integrated circuits production-programming services using customer software programs provided and is carried out under controlled conditions as follows;


- a) Controlled work instructions, quality plans, programming and test software defining the manner of production/programming and acceptability criteria of the product characteristics,
- b) Use of suitable and approved production/programming processes and equipment availability and use of monitoring and measuring devices in suitable work environment,
- c) Monitoring and measurement process parameters and product characteristics,
- d) Suitable maintenance of equipment to ensure process capability.
- e) Release of acceptable product to Avnet Logistic Store for storage or delivery to customer.

The programmed integrated circuit once installed in the customer system is non-serviceable, thus after sales servicing is not applicable.

7.5.2 Validation of processes for production and service provision

New devices or new programs or approved products for production programming where test software is not provided, are validated (first article validation for new devices or programs) to demonstrate the ability of the programming process and activities can achieve required results. Validation is also performed as follows;

- a) Review and approval of the programming processes meets product requirements,

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

- b) Approved and suitable equipment and certified personnel are used for programming or testing or inspection,
- c) Programming is performed in accordance to quality plans, work instructions and maintain traceability of device and program used,
- d) First article record is available and approved for new devices or new programs and lot travelers for production parts.

7.5.3 Identification and traceability

- a) Avnet has Programming center identify the product by means of labels and/or lot traveler accompanying the product indicating identity, customer, lot or batch number and status of measurement and monitoring results to requirements from devices receiving for programming until its return to Avnet logistic warehouse. Rejected material is positively identified for control of nonconforming product to prevent unintended use or delivery.
- b) The product traceability is controlled and recorded of its unique identification in the lot traveler accompanying the product.

7.5.4 Customer property


- a) Avnet Asia Programming center exercises care with customer property including intellectual property and its confidentiality while under the Center's control or for use or incorporation into the product by the Center and is identified, verified, protected and safeguarded.
- b) Any customer property that is lost, damaged or unsuitable for use is recorded and reported to the management for resolution with customer.

7.5.5 Preservation of product

Avnet Asia Programming center preserves conformity of products or its constituent parts during internal processing and delivery to the intended destination by adequate identification, handling, packaging, storage and protection to prevent damages or deterioration due to mishandling, environmental effects or E.S.D.

7.6 Control of monitoring and measuring devices

- 7.6.1 Avnet Asia Programming center determine the monitoring and measurement to be undertaken and the monitoring and measuring devices needed to provide evidence of conformity of product to determined requirements.
- 7.6.2 the monitoring and measurement required is carried out and using monitoring and measuring devices based on function, range, accuracy and precision that is consistent with the monitoring and measurement requirements.
- 7.6.3 In order to ensure valid results, measuring equipment is
 - a) Calibrated (adjusted or re-adjusted as necessary) or verified at specified intervals, or prior to use, against certified measurement standards traceable to international or national measurement standards or in accordance to internal calibration instructions for each equipment type defining frequency of checks, check method and environment, acceptance criteria and the action to be taken when results are unsatisfactory;
 - b) Identified to enable the calibration status to be determined;
 - c) Safeguarded from adjustments that would invalidate the measurement result after the calibration or its verification;
 - d) Protected from damage and deterioration during handling, maintenance and storage.
- 7.6.4 In addition, when the equipment is found not to conform to requirements, the center assesses and records the validity of the previous measuring results and takes appropriate action on the equipment and any product affected. Records of results of calibration and verification are maintained.
- 7.6.5 The ability of computer test software used in the monitoring and measurement of specified requirements, to satisfy the intended application is confirmed prior to initial use and reconfirmed before each set up for an order. Where the availability of technical data pertaining to the monitoring and measurement device specified customer requirement, a copy is submitted for customer verification of the monitoring and measurement device functional adequacy.

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 15 of 20

8.0 MEASUREMENTS, ANALYSIS AND IMPROVEMENT

8.1 General

The Center plans and implements the monitoring, measurement, analysis and improvement of processes needed that include determination of applicable methods and statistical techniques where appropriate to;

- a) Demonstrate conformity of the product,
- b) Ensure conformity of the quality management system, and
- c) Continually improve the effectiveness of the quality management system.

8.2 Monitoring and measurement

8.2.1 Customer satisfaction

- a) The Center monitors information relating to customers' perception and satisfaction of customers' requirements through customer satisfaction surveys as a measurement of performance of the quality management system.

8.2.2 Internal audit

- a) The Center establishes and maintains a documented procedure QMSP 8 that defines responsibilities and requirements for audit planning, conducting, criteria, scope, frequency, methods, reporting results and maintaining records.
- b) The internal audit is planned at least annually to determine the quality management system's conformity to planned arrangements established, requirements of ISO 9001:2008 Standard, is effectively implemented and maintained. Additional Internal audit may also be scheduled basis on status and importance of processes and areas to be audited as well as the results of previous audits.
- c) Auditors selected do not audit their own work and conducts the audit ensuring objectivity and impartiality. The auditors could audit the work cross functionally in Avnet Asia Programming Center.
- d) Audits result is reported to responsible area management being audited who ensures that actions are taken within agreed times to eliminate audit nonconformity detected and their causes.
- e) Follow-up audit activity includes verification of the actions taken effectiveness and report of the verification result.
- f) The internal audit result is summarized into report for inclusion into the Management Review.

8.2.3 Monitoring and measurement of processes

- a) The Center identifies objectives for quality management system processes. Suitable methods are applied to monitor, measure, report and demonstrate their performances to achieve planned results for management review. When planned results are not achieved, appropriate correction is planned and implemented, to ensure product conformity.


8.2.4 Monitoring and measurement of product

- a) Product characteristics are monitored and measured at various stages of the product realization process using methods; statistical techniques as identified in the quality plan to verify that product requirements are met.
- b) Monitoring and measurement records are maintained indicating the person authorizing release of product and evidence of conformity with the acceptance criteria. The customer releases to the next process or for delivery product only when all requirements of the quality plan had been satisfactorily completed, unless otherwise approved by QA Director and, where applicable.

8.3 Control of nonconforming product

8.3.1 any product/material not conforming to requirements is identified and controlled to prevent its unintended use or delivery by segregating from acceptable material. The controls and related responsibilities and authorities for dealing with product nonconformity are documented in QMSP 8. The nonconformity product is dealt by;

- a) Taking action to eliminate the detected product nonconformity (identify, document, segregate, evaluate & disposition to rework to meet the product requirements or reject or scrap, notify to concerned functions for appropriate action).
- b) Authorizing its use, release or acceptance under concession by QA Manager and customer if required by contract:

	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 16 of 20

- c) By taking action to preclude its original intended use (identify, document, segregate, or for alternative applications).

8.3.2 the nonconformity and any subsequent actions taken, including concessions obtained, is recorded and maintained.

8.3.3 Repair/rework nonconforming product is re-inspected to demonstrate conformity to the product requirements.

8.3.4 when nonconforming product is detected after delivery or use has started, appropriate action to the effects, or potential effects, of the nonconformity is taken.

8.4 Analysis of data

8.4.1 The Center determines, collects and analyzes appropriate data into reports for management review to demonstrate the suitability, effectiveness and the continual improvement of the quality management system as appropriate. The data is generated from resulting information of monitoring and measurement of product and processes related to:

- a) Customer satisfaction
- b) Conformance to product requirements;
- c) Characteristics (control, verify product and process characteristics with appropriate statistical techniques as in quality plans), and trends of processes and products including opportunities for preventive action, and
- d) Suppliers.

8.5 Improvement

8.5.1 Continual improvement


- a) The Center continually prioritizes to improve the quality management system effectiveness. The improvement needed is identified through use of analysis of data for quality objectives, audit results, corrective or preventive actions, changes needed to the quality system as a result of applicable external inputs received and management review as appropriate.

8.5.2 Corrective action

- a) The Programming Center takes action to eliminate the cause of nonconformity of product (including customer complaint) in order to prevent recurrence. Corrective action taken is appropriate to the effects (severity and magnitude) of the nonconformity encountered.
- b) QMSP 8 establishes the requirement and procedure for corrective action that includes:
 - i) Reviewing nonconformity (including customer complaints),
 - ii) Determining the causes of nonconformity,
 - iii) Evaluating the need for actions to ensure that nonconformity do not recur,
 - iv) Determining and implementing action needed,
 - v) Records of the results of action taken and
 - vi) Reviewing the effectiveness of the corrective action taken.

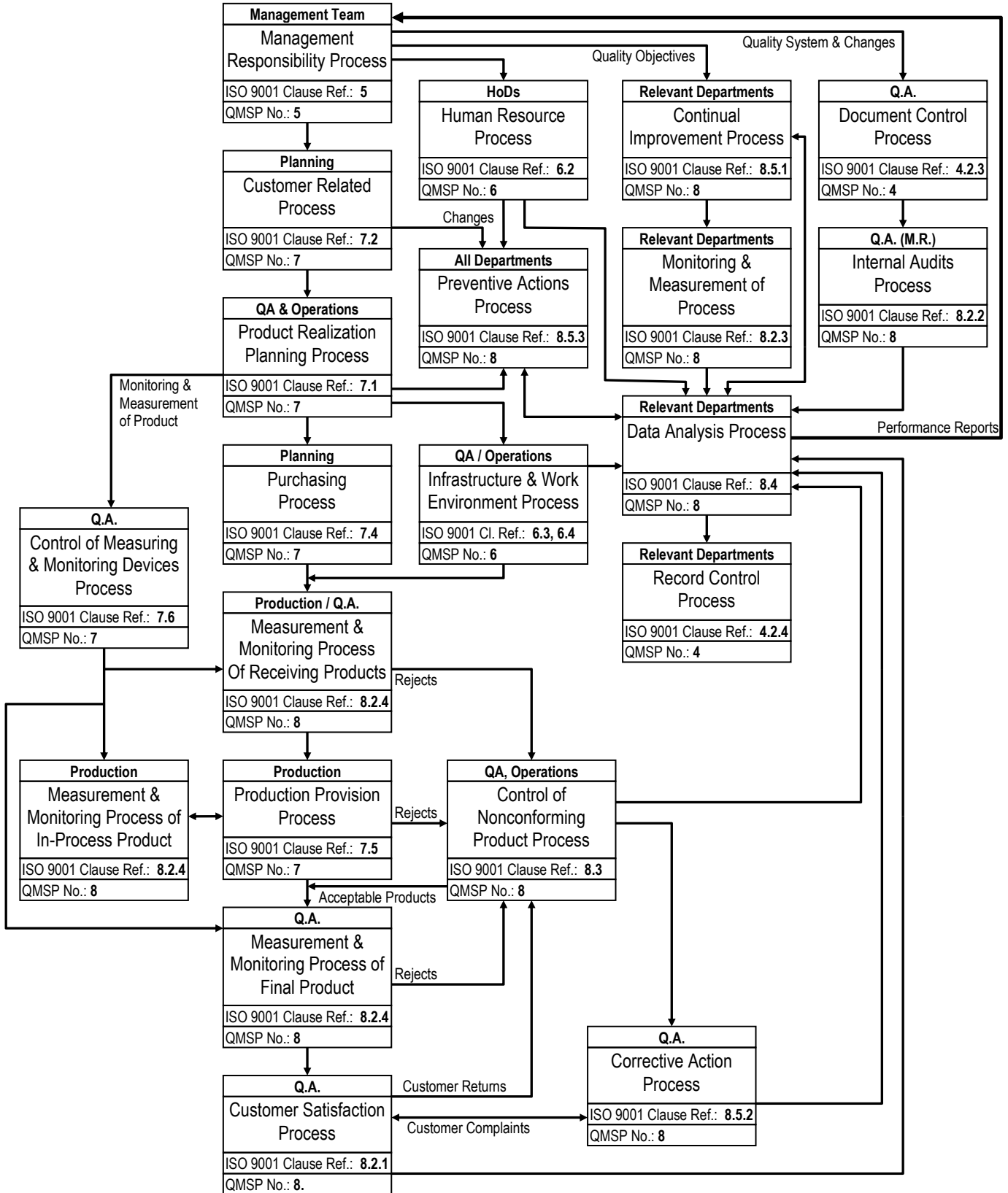
8.5.3 Preventive action


- a) The Center detects potential nonconformity to the quality management system and identifies potential causes, and takes preventive actions appropriate to the effects of the potential problems to prevent its occurrence.
- b) QMSP 8 establishes the procedure for preventive action that includes:
 - i) Determination of potential nonconformity and their potential causes that may arise due to changes affecting the quality management system, new products, analysis of processes or product quality failures or customer complaints for application to new products or processes, quality audit results, concessions.
 - ii) Evaluate the need for action to prevent occurrence of nonconformity,
 - iii) Determine and implement action needed,
 - iv) Record results of action taken,
 - v) Review the effectiveness of the preventive action taken.

 Reach Further™	Title: Quality Manual	Doc. No. QM 8001	Date of Issue: Feb 28, 2004	QA Stamp
	Department or Process: Management	Revision 8	Change Effective Date: Sep 25,2012	Confidentiality Business Use Only

Page 17 of 20
Annex A:

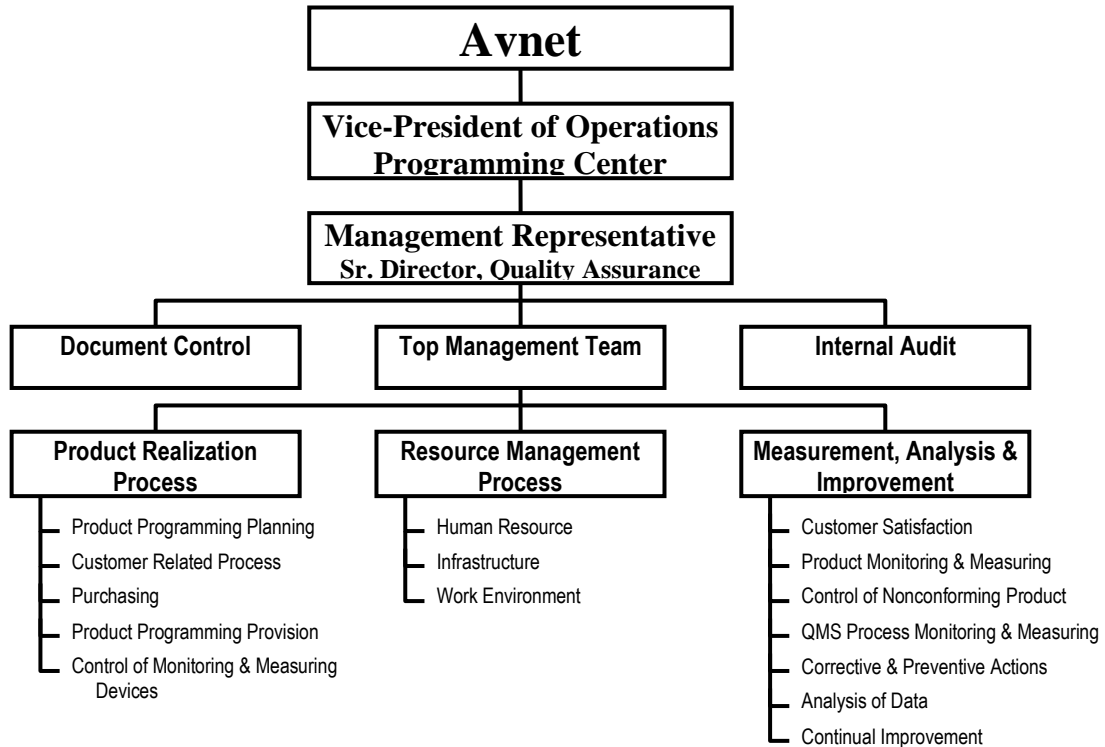
Avnet Asia Programming Center Quality Management System Process Plan



 Reach Further™	Title: Quality Manual	Doc. No. QM 8001	Date of Issue: Feb 28, 2004	QA Stamp
	Department or Process: Management	Revision 8	Change Effective Date: Sep 25,2012	Confidentiality Business Use Only

Page 18 of 20
Annex B


Quality Management System Organization Structure



Responsibility, Authority & Interface Matrix


			Head Of Organization		Operation V.P				
			Head of	Department	QA		Operation		
			Functions	Operations Head	Site M.R.	Q.A.	Eng'rg / Operations	Material Planning	Production
ISO 9000 Cl. No.	ISO 9001: 2008 Clause Description	Q.M. Para. No.	QMSP No.						
4	Quality Management System	4	4						
4.2.3	Document Control	4.2.3	4		M	S	S	S	S
4.2.4	Control of Quality Records	4.2.4	4		M	M	M	M	M
S	Management Responsibility	5	5	S	M	M	M	S	S
6	Resources management	6	6						
6.2	Human Resource Management	6.2	6		S	S	M	S	S
6.3	Infrastructure Management	6.3	6			S	M		S
6.4	Work Environment Management	6.4	6			S	M		S
7	Product Realization Processes	7	7						
7.1	Product Realization Planning	7.1	7			M	M	M	M
7.2	Customer Related Process	7.2	7				S	M	S
7.3	Design and Development	7.3	N. A.						
7.4	Purchasing	7.4	7			S	M	M	M
7.5	Product & Service Provision	7.5	7			S	S		M
7.6	Control of Monitoring & Measuring Devices	7.6	7			M			
8	Measurement Analysis & Improvement	8	8						
8.2.1	Customer Satisfaction	8.2.1	8		S	M	S	S	S
8.2.2	Internal Audit	8.2.2	8			M			
8.2.3	Monitoring & Measurement of QMS Process	8.2.3	8		M	S	S	S	S
8.2.4	Monitoring & Measurement of Product	8.2.4	8			M	S		M
8.3	Control of Nonconforming Product	8.3	8			M	S	S	S
8.4	Analysis of Data	8.4	8		M	M	M	M	M
8.5.1	Corrective Action	8.5.1	8			M	S		S
8.5.2	Preventive Action	8.5.2	8		M	M	M	M	M
8.5.3	Continual Improvement	8.5.3	8		M	S	S	S	S

Legend: M = Main Role (Plan, Evaluate, Approve, Change, Report, Coordinate, Implement, Corrective Action)
S = Support Role (Implement, Record)

	Title: Quality Manual	Doc. No. QM 8001	Date of Issue: Feb 28, 2004	QA Stamp
	Department or Process: Management	Revision 8	Change Effective Date: Sep 25,2012	Confidentiality Business Use Only

Quality Responsibility, Authority & Required Competency

#	Level (Job Position)	Quality Responsibility	Quality Authority	Min. Competency -- Knowledge (Education/Training)/Experience / Skill
1.	Head of Organization (V.P of Programming Center)	<ul style="list-style-type: none"> Overall responsibility for Warehouse (COI and AL Purchased materials) & Programming Center Operation's performance, operations control & P&L (Profit & Loss). 	<ul style="list-style-type: none"> Approval of resources for Warehouse (COI and AL Purchased materials) & Programming Center Operations, infrastructure, human resources & finance. 	<ul style="list-style-type: none"> Appropriate tertiary education. Management experience on warehouse and production operations. Familiar with programming business.
2.	Operations Manager / Centre Manager (Site Management Representative)	<ul style="list-style-type: none"> Establish, implement & maintain quality management system processes meeting ISO 9001:2008 & customer requirements. Report quality management system performance & any needed improvement to Top Management. Promote awareness of customer requirements throughout the Center. Liaison with external parties on matters relating to the quality management system. Coordinates Internal Quality Audit Activities Prepare management review minute & distribute to relevant staff for required follow up actions. Provision & Management of Resources for Facilities & Product Realization. Coordinate product quality planning; document, implement & qualify of new Products & Processes. Provide required inputs & participate in Management Reviews. Identify & Coordinates Process Improvements, Corrective or Preventive Actions required. Manage Orders received & production schedule within agreed cycle time. 	<ul style="list-style-type: none"> Authorize conduct of Quality Audits Authorize documents and procedures related to Q.M.S. Represent the company on Quality management system matters to customers & 3rd party auditors. Approve purchases of hard wares, materials & services to enable product realization. Approve installation set up. 	<ul style="list-style-type: none"> Tertiary education in technical discipline. Familiar with Quality management System, Quality Methodology, Statistical techniques. Knowledge of customers' requirements Conduct Quality Audits Document Control Procedures. Knowledge of customers' requirements Knowledgeable, experienced & skillful on product, product processing, device programming & relevant requirements of ISO 9001:2008. Knowledge on ESD and controls. Skill in operations management to meet quality and delivery objectives.
3.	Head of Departments Senior Director, Quality Assurance (Regional Management Representative)	<ul style="list-style-type: none"> Act as the Center's Q.M.S. Representative. Consult, coordinate and support on matters related to product & service quality. Liaison with customer on quality matters. Evaluate & dispose nonconforming product. Control of quality documents, data and records. Participate & conduct management review. Coordinate & assist in Continual Improvement, Corrective & Preventive Action Annual Quality Planning & Budget for Company and Department. Provides suitable quality reports to manage the Center's quality performance. Evaluation of Supporting materials and suppliers & maintain Approved Vendor List. 	<ul style="list-style-type: none"> Review & approve appropriate course of actions on all quality matters (within Avnet or with suppliers or customers). Approve QMS, Product & Service quality document & data. Evaluate and dispose non-conforming product from production or field return. Authorize nonconforming product return and recall from the field. Stop production when nonconforming to customer requirements. Approve Purchases on budgeted quality products or services. Approve supporting material suppliers. Handle product Quality matters with customers. 	<ul style="list-style-type: none"> Tertiary education in technical discipline. Knowledgeable Quality management System, QA/QC Methodology, Statistical techniques. Knowledge of customers' requirements Knowledgeable & experienced on product, product processing & device programming. Knowledge on ESD and controls.
4.	Technical Executive (Product Engineer, Technical Engineer, Production Engineer)	<ul style="list-style-type: none"> Training support to production on technical matters Engineering Support for product realization such as Measurement, Analysis and Improvement, calibration & maintenance of equipment & software programs. New Product / Customer Support & Qualification. Support Production to meet Quality Objectives. Maintain approved product and program database. 	<ul style="list-style-type: none"> Approve Technical work procedures for production implementation. Qualify and approve new products before submission to customer for acceptance. Shut down process for corrective action when quality requirement is not met. 	<ul style="list-style-type: none"> Tertiary education in technical discipline. Knowledgeable, experienced & skillful on product, product processing & device programming. Knowledge on ESD and controls. Knowledge on relevant requirements of ISO 9001:2008

 AVNET [®] Reach Further™	<i>Title:</i> Quality Manual	<i>Doc. No.</i> QM 8001	<i>Date of Issue:</i> Feb 28, 2004	<i>QA Stamp</i>
	<i>Department or Process:</i> Management	<i>Revision</i> 8	<i>Change Effective Date:</i> Sep 25,2012	<i>Confidentiality</i> Business Use Only

Page 20 of 20

#	Level (Job Position)	Quality Responsibility	Quality Authority	Min. Competency -- Knowledge (Education/Training)/Experience / Skill
5.	Non-Technical Executive (Customer Service /Planner)	<ul style="list-style-type: none"> • Production & Materials planning, schedule tracking, materials withdrawal from Avnet Warehouse. • Purchase of supporting materials for production. • Interface with Avnet Corporate Sales to review orders and quotations. 	<ul style="list-style-type: none"> • Material Withdrawal from Avnet Warehouse for production. • Receive of purchased materials. • Accept orders within the Centers Capability and Capacity documented. 	<ul style="list-style-type: none"> • Tertiary education. • Knowledge & use of SAP MRP Software and capabilities. • Approved Capacities & Capabilities • Relevant Quality System procedures.
6.	Technician	<ul style="list-style-type: none"> • Calibration & maintenance of equipment & software programs • Technical support to production on technical matters 	<ul style="list-style-type: none"> • Shut down process for corrective action when quality requirement is not met. • Upgrade the programmer software version to match approved version 	<ul style="list-style-type: none"> • Tertiary education in technical discipline. • Knowledgeable, experienced & skillful on product and equipment. • Knowledge on ESD and controls
7.	Worker/Inspector (Programming Operator Programming Inspector)	<ul style="list-style-type: none"> • Perform production or inspection processes in accordance to work instructions trained to them. • Complete all necessary records by them after each completion of their production work. • Maintain work environment during and after performing their work. • Report all problems & nonconformance encountered to their superiors for investigation & corrective action. 	<ul style="list-style-type: none"> • Reject non-conforming products, segregating and identifying the rejected products for Engineering or QA review. • Transfer acceptable products to subsequent operation after completion of required forms. • Shut down production process for corrective action when serious level of nonconformance is encountered. 	<ul style="list-style-type: none"> • At least secondary education. • Production process & device handling • Work duties & responsibilities • Relevant ISO 9000 procedures, instruction and forms to use. • ESD and clean room practices.