


REV	DESCRIPTION OF CHANGE	DCO #	DATE	APPROVED BY
A	Initial Release	22974	7/24/97	S. Wallace
B	Change all Litton References to Filtronic	26703	10/28/98	S. Wallace
C	Change all Filtronic references to TDY & change the clauses	D05528	10/13/05	M. Culberston
D	Add new Q Clause Q-50	D05730	2/7/06	R. James
E	Add new Q Clause Q-41	D06175	7/24/06	R. James
F	Add new Q Clause Q-42	D06207	8/3/06	R. James
G	Add new Q Clause Q-43	D06329	9/26/06	R. James
H	Change clauses Q-9 and Q-39	E00495	4/12/07	R. James
J	Add new Q Clause Q-44	E01615	08-01-02	M. Culbertson
K	Redefine Q Clause Q-42	E02737	7/29/08	M. Culbertson
L	Add new Q-Clause, Q-45	E04094	09-06-09	M. Culbertson
M	Correct revision on footer	E04790	09-12-06	M. Culbertson
N	Formatting Problem	E05154	10-02-11	M. Culbertson
P	Update for AS9100 Requirements	E05403	10-14-07	M. Culbertson
R	Correct omission error in prior ECO E05403	E07043	11-05-17	M. Culbertson
T	Add data retention requirements per AS9100 Rev C	E07165	11-06-20	

Procurement Quality Requirements ("Q" Clauses)

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TELEDYNE Microwave 1274 Terra Bella Ave. Mountain View, CA. 94043	ELECTRONIC FILE ID QAX010t.doc	DOCUMENT NUMBER QAX-010	REV T
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PROCUREMENT QUALITY REQUIREMENTS

"Q" - CLAUSES

1. PURPOSE

This document defines the Quality Assurance requirements (Q Clauses) which are applicable as specified on the Procurement Document.

2. DEFINITIONS

The following definitions shall apply to this document.

2.1 Procurement Document:

The purchase order, subcontract or other written agreement with the Seller in which this Attachment "B" document is incorporated by reference.

2.2 Buyer:

Teledyne Microwave purchasing agent.

2.3 Seller:

Any supplier of materials or services in accordance with purchase order requirements, as well as all applicable procurement quality clauses as specified herein.

3. GENERAL QUALITY ASSURANCE REQUIREMENTS

The following Quality Clauses are a requirement of all procurements.

Q-1. General Quality Assurance Requirements (Includes paragraphs A through N below)

A. Nonconforming Material Control

Seller's system for nonconforming material control shall provide for the identification and segregation of nonconforming materials. The disposition of such nonconforming material is limited as follows:

1. Rework to drawing or specification by completing incomplete operations, or
2. Replace discrepant supplies with acceptable ones, or
3. Scrap, except that Buyer furnished material will not be scrapped without prior approval of the Buyer, or
4. Submit the nonconformance to the Buyer for Buyer Material Review Action.

B. Supplier Corrective Action Request

When, during the course of this Purchase Order, the Buyer determines that the Seller's quality control system is deficient or discovers discrepancies in Seller's material, hardware or services, the Buyer may forward to the Seller a Supplier Corrective

Action Request (SCAR) for Seller action pursuant to the following:

1. The SCAR will be forwarded from the Buyer and shall be completed and returned to the Buyer, in accordance with instructions provided with the SCAR.
2. When required by the individual SCAR, Seller will obtain Buyer Quality Assurance representative's concurrence with the indicated corrective action for that SCAR, prior to return to cognizant Buyer.
3. SCAR's provided to the Seller by the Buyer's Quality Assurance personnel servicing the Seller's facilities shall be completed and returned to the QA representative within 30 days of receipt of the SCAR, unless otherwise specified on the SCAR.
4. The Seller's response on the SCAR shall identify the cause of the discrepancy, the action taken to prevent recurrence and the effective point of the action by reference to unit number serial number or date, as appropriate.
5. Failure to respond within required time frame can result in actions up to and including removal from Teledyne Microwave's Approved Supplier list.

C. Buyer Access

The Seller shall provide the Buyer and Government personnel access to any and all areas, including those of lower-tier suppliers, where work is being or scheduled to be performed under this Purchase Order.

Seller shall include the provisions of this clause in its purchase orders with such lower-tier suppliers.

D. Sampling Inspection - Buyer

Parts/material supplied under this Purchase Order may be subjected to sampling inspection by the Buyer. Should the parts/material be rejected, the Buyer at his option may return the entire lot for credit or replacement.

E. Prohibited Practices

1. Unauthorized Repairs:

Seller may not repair by welding, brazing, plating, splicing, soldering or adhesives, items damaged or found to be faulty during manufacture, without

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Buyer's prior written approval. Defects in castings or forgings shall not be repaired by any method without Buyer's prior written approval.

2. Change in Approved Drawings, Processes, Materials or Procedures:

Seller shall not change any drawing, process, material or procedure without the Buyer's prior written approval, if such drawing, process, material or procedure was originally approved by the Buyer. Additionally, Seller shall not change any process, material or procedure from that used to qualify items or which was used by Seller to become a qualified source, without prior written approval by the Buyer.

3. Resubmittal of Rejected Items:

Items rejected by the BUYER may not be resubmitted to the BUYER without clear and proper identification as resubmitted articles, indication of the cause for rejection and statement of action taken by the Seller to correct the deficiencies.

4. Unauthorized Submittal of Production:

When the procurement document requires Buyer acceptance of a "first article" Seller shall not submit items from a production run for Buyer inspection prior to Buyer's acceptance of such "first article".

5. Notification of Facility Change:

Seller shall not use or relocate any production, manufacturing and/or processing facilities during performance of the work specified on the Procurement Document from those production, manufacturing or process facilities approved by the Buyer, without promptly notifying the Buyer and affording the Buyer an opportunity to examine such facilities for compliance with Quality Assurance requirements.

F. Responsibility for Conformance

Neither surveillance, inspection and/or test made by THE BUYER or its authorized representative at either the Seller's or THE BUYER's facility, nor the Seller's compliance with all Quality Assurance requirements shall relieve the Seller of the responsibility to furnish items which conform to the requirements of the Procurement Document.

G. Documentation

THE BUYER may refuse to accept items delivered under the Procurement Document if the Seller fails to submit the certification, documentation, test data or reports specified in the Procurement Document.

H. Certificate of Compliance Audit

Certifications furnished under the terms of the Procurement Document are subject to audit by BUYER QA representative for supporting test records and data.

I. Minimum Packaging

All items delivered to THE BUYER shall be packaged and protected from deterioration and physical damage. Damaged finishes, details, distortion, or internal damage shall be reason for rejection. THE BUYER shall have the prerogative of returning all damaged items to the Seller. When multiple part types are shipped to THE BUYER in one container, each part number shall be segregated and packaged into a separate internal container. The applicable part number and serial number shall appear on each individual package within the container. All test data sheets shall be packaged together in a common envelope inside the outer container, not separately with each unit.

J. Measuring and Test Equipment

Seller shall be responsible for validating the accuracy and stability of tools, gauges and test equipment used to demonstrate that items conform to the Procurement Document. Documented schedules shall be maintained to provide for periodic calibration to adequate standards. Objective evidence of calibration shall be recorded and made available for Buyer review.

K. Distributor's Certificate

The following information, in the form of a signed certificate, must accompany the first shipment of each item on this Procurement Document.

1. Manufacturer's Name and Address
2. Manufacturer's Part Number
3. Lot Number or Lot Date Code
4. Manufacturer's QC Acceptance Lot No.
5. Distributor's Name and P.O. Number

6. Test Summary or Report of Quality Conformance Inspection

L. COUNTERFEIT MATERIAL PROHIBITED

The seller shall ensure that only new and authentic materials are used in products delivered to Teledyne. The seller may only purchase parts directly from OEM/OCMs or Franchised Distributors or Authorized Distributors. Use of product that was not provided by these sources is not authorized.

M. FLOW DOWN REQUIREMENTS:

Seller shall flow down to sub tier suppliers all applicable requirements of the procurement documentation, including Key Characteristics, where required.

N. DATA RETENTION REQUIREMENTS

Pertinent production records are to be maintained for a minimum of 5 years.

4. SPECIFIC QUALITY ASSURANCE REQUIREMENTS

The following Quality Clauses are a requirement of this procurement when specified by number on the Procurement Document.

Q-4. INSPECTION SYSTEM

The Seller shall maintain an Inspection System adequate to assure that supplies shipped on this order meet all of the applicable requirements. The system shall also provide for the maintenance of records and data of all inspections and tests performed and shall make these records available for examination and verification by THE BUYER QA personnel upon request.

Q-6. CERTIFICATE OF CONFORMANCE

A. With each shipment of items covered by this Procurement Document, Seller shall submit a certificate of conformance, signed by a responsible representative, which shall constitute a representation by the Seller that:

1. Materials used are those which have been specified by Buyer, and that the items delivered were produced from materials for which Seller has on file reports of chemical or physical analysis and any other applicable specifications.
2. Processes used in the fabrication of items delivered were in compliance with applicable specifications forming a part of this Procurement Document.

3. The items as delivered comply with all specifications and other requirements of this Procurement Document.

B. Drop shipments - since material ordered hereunder is to be shipped direct to another Teledyne supplier, copies of the Quality Assurance data required by this order shall accompany the shipment. In addition, one copy of data shall be mailed to the Buyer on the same date that the shipment is made.

Q-7. PRODUCT CHANGE APPROVAL

Without prior approval by the Buyer in writing, the Seller shall not make any changes in the following from end items accepted by the Buyer under the Procurement Document and found to be satisfactory for their intended purposes: changes in product design, composition, configuration (including form, fit, function, or interchangeability), material, fabrication, Seller's supplier, place of manufacture, or outside processing. Seller shall flow down this requirement to Seller's suppliers.

For every proposed change, the Seller shall submit supporting data, which verifies that, it will not degrade the quality or reliability of the product. The supporting data shall include as a minimum (a) the reasons for the change, (b) considerations of the effect of the change upon performance, failure rate, traceability, reliability and storage life, and (c) analysis and/or test evidence which shows the effect of the proposed change.

Q-8. NOTIFICATION OF PRODUCT CHANGE

Seller shall notify the Buyer of any changes in product design, fabrication methods, material or process from those used by Seller at time of Seller's quotation or offer to Buyer which resulted in the Procurement Document.

Q-9. ELECTROSTATIC DISCHARGE CONTROL

The supplier shall take necessary actions to ensure that static susceptible units, assemblies and components are adequately protected from Electrostatic discharge (ESD) damage during the manufacturing, test, inspection, packaging and shipping cycles.

Packaging shall be static shielding per ANSI/ESD-S20.20-1999 and shall be marked with an ESD cautionary note and/or symbol.

Q-11. PERMANENCY OF MARKING

Marking, such as for part identification, stamping, etc., shall be permanent and not adversely affected by solvents used in cleaning processes. Marking shall be capable of passing the tests specified in MIL-STD-202, Method 215.

Q-12. INSPECTION AND TEST REPORTS

As indicated by the Procurement Document, one or more of the certified inspection and test reports listed in this clause are required.

Reports shall be legible and reproducible. They shall include copies of original data identifiable to individual parts, units, batch, lot or heat, as applicable; and they shall be included with the packing slip for each shipment.

- A. Dimensional inspection report.
- B. Electrical and/or mechanical test report.
- C. Chemical or physical test report.
- D. Functional test report.
- E. Environmental test report.

Q-13. PERISHABLE/AGE DATED MATERIAL

Indicate either on the container or provide a document stating the following: Shelf life at room temperature and date of manufacture and if life can be extended by refrigeration. **DO NOT SHIP MATERIAL WITH LESS THAN 80% OF USEFUL SHELF LIFE.**

Q-14. TOOL PROOFING

Tooling required for production under this Procurement Document is subject to acceptance by THE BUYER. The Seller shall notify THE BUYER when tooling is ready for inspection. BUYER acceptance will be contingent upon inspection of applicable characteristics of a quantity of dimensional samples as specified by the Procurement Document. The tooling and dimensional samples produced by this tooling must conform to the tolerance limits of engineering drawings and specifications stated in this Procurement Document. The inspection shall be under the surveillance of the cognizant BUYER Quality Assurance representative at the Seller's facilities or the items will be shipped to THE BUYER for inspection as directed by the Buyer.

Dimensional samples should be identified with a tool number.

Q-15. TEST SAMPLES

The Seller shall furnish to the Buyer the test samples required by this Procurement Document. The samples shall be identified as "Test Samples" with applicable part number. The test samples shall be processed simultaneously with each batch of lot of parts. Seller's shipping document shall indicate part number, process, processor, batch/lot number.

Q-16. FIRST ARTICLE TEST/INSPECTION

Buyer acceptance of first article test and inspection is required prior to manufacture of the production run.

The first article shall be identified as such, including the Procurement Document number, part number and revision level, and part name.

The Seller is required to:

- A. Submit the first article for test/inspection to be conducted at Seller's facility by the Buyer.
- B. Submit the first article to the Buyer's Receiving Inspection Department for test/inspection by Buyer at Buyer's facility.
- C. Submit the first article to the Buyer's Receiving Inspection Department together with documents showing data representing results of Seller's first article test/inspection, including actual dimension or value for each specified characteristic.

Q-17. SERIALIZATION

With each shipment, the Seller shall submit a legible copy listing all serialized parts and assemblies by part number, within the serialized end item shipped. No two parts having the same part number (under this Procurement Document or any other Procurement Documents) are to be identified with the same serial number unless otherwise specified.

Records must be maintained by the Seller identifying the serial numbers of serialized subassemblies contained in deliverable end items. The serial numbers to be assigned by part number are included with this Procurement Document B. The supplier shall assign serial numbers to those parts, assemblies and end items required by this Procurement Document to be serialized or shall

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assign serial numbers to the end items if this quality clause is applicable even though the Procurement Document does not otherwise require serialization.

Q-18. TELEDYNE SOURCE INSPECTION

The items to be supplied under this procurement document are subject to inspection by Teledyne Quality Assurance Representative(s) at any time during design or manufacture thereof. Notify Teledyne Q.A. department five (5) days in advance of any shipments to permit scheduling of source inspection. This requirement does not relieve the Seller of the responsibility for final inspection and/or test, not does it constitute final acceptance by Teledyne.

Drawings, inspection and test records and/or other pertinent data which may be required for adequate audit shall be made available to the BUYER Quality Assurance Representative. Evidence of BUYER source inspection must be shown on the shipping documents.

Q-19. WORKMANSHIP

Workmanship shall conform to the applicable requirements of the documents provided with the Purchase Order _____

Q-20. PROCUREMENT DOCUMENT CHANGES

All Quality Assurance requirements and conditions previously established by the Procurement Document are not affected by this change order.

Q-21. AGE OR ENVIRONMENT CHANGES

The Seller shall identify materials and articles having definite characteristics of quality degradation or drift with time and/or environment. This identification shall indicate the date and/or cycle that the critical life was initiated and the date and/or cycle at which the useful life will be expended.

Q-22. HARMFUL MATERIALS

All materials which are volatile, toxic, or emit fumes which are harmful to human health shall be properly contained in accordance with applicable specifications. The containers will be plainly marked as to contents with appropriate warning, precautions, instructions, and storage conditions.

Q-23. SPECIAL PROCESSES

When the terms of the Procurement Document require approval or certification of special processes, such approval or certification must be established with THE BUYER prior to fabrication under this Procurement Document. The Seller is responsible for, and must certify to, special process specification compliance by all of his subcontractors, and must maintain objective evidence thereof.

Processes performed to applicable Military or THE BUYER specifications must be certified, and certificate attesting thereto shall accompany each shipment, stating that evidence of this certification is on file subject to examination.

Q-24. RUBBER CURE DATA

Certification must be supplied separate from Seller's packing sheet, but included with the material, specifying rubber cure date and durometer reading.

Q-25. TRACEABILITY

The items supplied under this Procurement Document must be accompanied by documents stating the heat, lot or batch number. When raw material is not supplied by THE BUYER, the lot number for parts manufactured will have traceability to the heat, batch number, spool, etc. of the raw material used to manufacture the parts. Evidence of traceability of such raw material must be retained on file and shall be available for review by THE BUYER representative(s).

Q-26. SELLER'S CATALOGS/DATA SHEETS

Two (2) legible copies of applicable specifications, drawings and/or catalogs or catalog page(s) sufficient to inspect and/or test this material are to accompany the initial shipment on the Procurement Document. No change shall be made in subsequent shipments unless approved by Buyer.

Q-27. BUYER SUPPLIED MATERIAL

Material supplied by the Buyer is to be utilized by the Seller for the fabrication of parts specified on this Procurement Document. No substitutions are to be made without written approval from the Buyer.

Q-28. SPECIAL HANDLING REQUIREMENTS

All items delivered to the Buyer by the Seller must be handled in compliance with Teledyne procedure number 9006506.

Q-29. CERTIFIED OPERATORS

Only operators with current certification to the following specification are allowed to perform assembly operations on materials supplied on this Procurement Document. Specification: IPC/J-STD-001 or other requirements as specified on Procurement documents

Q-30. MATERIAL SAFETY DATA SHEET

A copy of applicable Material Safety Data Sheet (MSDS) must accompany the first shipment of product submitted from Seller to Buyer.

Q-31. GOVERNMENT SOURCE INSPECTION

Government Inspection is required prior to shipment from your plant. Upon receipt of this Procurement Document, promptly notify and furnish a copy to the Government Representative normally servicing your plant so that the Government Inspection can be appropriately planned. If a Government Representative does not service your plant, contact the nearest Defense Contracts Management Area Office. If you cannot locate the Office, notify the Buyer immediately.

Q-32. MATERIAL REVIEW ACTION

When the Seller material review action affects interchangeability, external configuration, function, service life, safety, reliability or point of attachment to BUYER assemblies, written approval by the Buyer (change order) or a waiver from Buyer QA is required prior to shipment of the article. The Seller shall submit a copy of his material review and corrective action reports outlining the discrepancies and corrective action to the BUYER. The Buyer shall then notify the Seller, in writing, as to the acceptability of the material review action.

Q-33. RADIOGRAPHIC INSPECTION

Items requiring radiographic inspection will be submitted to a BUYER approved X-ray laboratory and processed in accordance with applicable specifications and standards cited in the Procurement Document. Findings will be reported in writing, including the name of the reader and the

signature of a responsible laboratory representative. The X-ray film and two (2) legible and reproducible copies of the report must accompany the material. An adequate method of identifying and cross-referencing each film exposure, report, and item must be provided. When parts are serialized, serial numbers must appear on the report and film.

Q-34. LOT CONTROL

Parts and/or material furnished under this Procurement Document, packing lists, certifications and other applicable documents must be identified by a manufacturing lot or batch number. Where stamping of individual parts is not practical due to the size or shape, the manufacturing lot or batch number shall be stamped on identifying tags or on the smallest unit packed by the Seller.

NOTE: In the absence of Lot Control Specification required by the Procurement Document, a lot or batch number shall be defined as parts and/or material produced by one manufacturer in one unchanged process in accordance with the same drawing and/or specification revision.

Q-35. INSPECTION AND TEST INSTRUCTION

The Seller shall prepare and maintain written instructions for inspections and tests performed in accordance with the terms of this Procurement Document. These instructions and tests shall be subject to approval by THE BUYER. The instructions shall include identification of the item to be inspected or tested, measuring and test equipment to be used, details of inspection and test operations to be performed and the criteria for determining conformance to Procurement Document requirements. Two (2) legible and reproducible copies of each instruction shall be furnished to the Buyer immediately after preparation and the instructions shall be available in the Seller's file for review by THE BUYER or cognizant Government agencies.

Q-36. NON DOCK TO STOCK

Items containing this Q Clause shall not go dock to stock. Parts must be inspected.

Q-37. MAGNIFIED INSPECTION

Requires Inspection under magnification. Parts will be inspected by THE BUYER under 7X magnification.

Q-38. HI-REL PACKAGING

Hi-Rel part requires parts to be packaged individually

Q-39. RoHS COMPLIANCE

Material must be certified as RoHS-Compliant.

Q-40. Material Content Declaration

Supplier must submit 100% Material Content Declaration per Teledyne document 7260563.

Q-41. CHEMICAL APPROVAL

This chemical is approved for use by Teledyne Microwave's EH&S Manager

Q-42. CERTIFICATE of ANALYSIS, PLATED METAL

Certificate of analysis shall be provided for each lot with thickness measurements of each layer of plated metals.

Q-43. PURE TIN PROHIBITED

The use of pure tin (97% tin) is PROHIBITED

Q-44. CERTIFICATE of ANALYSIS, SOLDERABILITY

With each shipment the supplier must submit a Certificate of Analysis and objective evidence that material has met the Solderability requirements of Method 2003 of the current revision of MIL-STD-883.

Q-45. APPROVED PLATING SUPPLIER REQUIRED

Supplier must use a plating process supplier that is on Teledyne Microwaves Approved Vendor List, as required by specific customer contract.

Q-46. CONTINUITY TEST (PCB SUPPLIERS)

Supplier to perform open/short continuity test.

Q-50. DOCK TO STOCK AUTHORIZED

This material will be processed DOCK-TO-STOCK bypassing Receiving Inspection.