

## TT Electronics Integrated Manufacturing Services Supplement to Purchase Order Quality Clauses TT Electronics Purchase Order

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### Q01 Quality System Requirements

The supplier shall establish and maintain a quality system that conforms to the requirements of ISO 9001:2008 or AS9100 current revision or previous revision prior to its expiration date

### Q02 Supplier's Quality Plan

The supplier shall submit to TT Electronics a Quality Plan describing the production flow, special processes, and inspection and test points, used in the manufacture of the items described on the P.O. The supplier's plan is subject to audit by TT Electronics and shall not be changed without approval of TT Electronics, its Customer.

### Q03 Control of Inspection Equipment

The supplier shall establish and maintain a calibration system that conforms to the requirements of ANSI/NCSL Z540 or ISO 10012

### Q05 Workmanship

Electronic materials and workmanship shall comply with the requirements of J-STD-001 and IPC-A-610.

### Q06 Certificate of Compliance

The items or services being shipped or being performed against this order must be accompanied by a Certificate of Compliance that assures full conformity with the Quality requirements, applicable drawings, specifications, and terms and conditions of this order. When Q13 is a requirement, a copy of the special process sub-tier supplier's certification is to be included in addition to the overall certification.

### Q07 Physical and Chemical Analysis

Physical and/or chemical analysis report to be supplied with each shipment.

### Q08 Inspection Evidence

The supplier shall maintain evidence of final inspection of material for a period of 10 years minimum or as directed by TT Electronics. This is flow down from our Aerospace Customers, which is flowed-down to them by the OEM's, Boeing, Airbus, Bombardier and Embraer Air. And the OEM's get it from the FAA, EASA (European Aviation Safety Administration) and Transport Canada Aviation Safety.

### Q09 Inspection /Test Data

A copy of inspection and/or test data shall be supplied with each shipment identifiable to the serial numbers and/or date code of items supplied.

### Q10 First Article Inspection

First Article Inspection and acceptance by TT Electronics is required on the 1<sup>st</sup> shipment. Supplier shall submit a complete First Article Report in accordance with AS9102 with the part(s) that it represents. No production lots shall be shipped until written approval or waiver of the first Article Report is received from TT Electronics. A new or delta first article must be completed when the item has not been manufactured in the past two years, when a drawing change occurs, when a new supplier for a detail part is used or when the manufacturing process or location has changed.

### Q11 Non-Destructive Test Report

Reports of all special processes and inspection methods, such as welding, heat treating, brazing, plating, x-ray, magnetic particle inspection, fluorescent penetrant inspection, etc. demonstrating compliance with all applicable specification and notes referenced on the drawing and/or purchase order shall be supplied with the material.

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### Q12 QPL Requirement

The MIL, AN and MS parts supplied against this order shall be manufactured by QPL sources.

### Q13 Special Processing

- a) All special processing and/or non-destructive testing, such as welding, heat treating, brazing, plating, painting, magnetic particle inspection, fluorescent penetrant inspection, radiographic inspection, etc. shall be performed by TT Electronics approved sources.
- b) General Electric: The supplier shall meet GE specification St000. NOTE: Request the applicable GE documentation and yellow pages source listing from the TT Electronics buyer if access is otherwise unavailable.

### Q14 Printed Wiring Boards/Assemblies Identification

All printed wiring boards/assemblies shall be marked with the manufacturer's trademark and date code. Printed wiring assemblies shall be serialized; method of serialization is optional.

### Q15 JAN Semiconductor Devices

All JAN devices shall meet the requirements of MIL-PRF-19500 Para. 3.7(a) or 3.7(b), as applicable.

### Q16 Traceability

Items supplied on this order shall be identified and traceable to their origin i.e. manufacturer, manufacturing date, date purchased, lot inspection, test data or other pertinent information relating to control of processes.

### Q17 Age Control

Manufacturing date, cure date, shelf life and/or expiration date, as applicable, are required. Material received, with more than 20% of its shelf life/cure date expired, shall be rejected.

### Q18 Static Sensitive Material

All integrated circuits and/or electrostatic sensitive devices must be delivered enclosed in electrostatic shielded tubes, sleeves, or other suitable protective materials. External packaging shall also have caution labels or marking indicating the contents contain electrostatic sensitive devices.

### Q19 Customer-Furnished Material

The supplier prior to use must inspect TT Electronics or Government-furnished material. When deficient material is found, the TT Electronics buyer will provide written instructions for disposition of the material.

### Q20 Configuration Control Requirements

To assure uniform quality and material configuration, no changes in materials, construction, source, external providers, facility location of manufacture or performance shall be made for the item(s) covered by this order without prior approval from TT Electronics. The supplier is expressly prohibited from supplying nonconforming material to TT Electronics without advance approval. Material Review Board review and disposition of nonconforming material shall be the sole responsibility of TT Electronics.

### Q21 Government Source Inspection

Government Source Inspection is required prior to shipment. Upon receipt of this order, the supplier will promptly notify the cognizant Government Representative or TT Electronics so that appropriate planning for Government Source inspection can be accomplished.

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### Q22 TT Electronics Source Inspection

TT Electronics Source Inspection is required prior to shipment. The supplier shall provide sufficient advance notice to TT Electronics to permit timely scheduling of source inspection.

### Q24 Dock to Stock

The supplier is authorized to ship directly to TT Electronics stock. TT Electronics reserves the right of revocation and the right to review and evaluate the supplier's processes and procedures. Only TT Electronics or authorized representatives of the supplier shall release material for shipment in accordance with the approved authorized release agreement.

### Q25 Workmanship

Electronic materials and workmanship shall comply with IPC-A-610, Class 2, current revision.

### Q26 Workmanship

Electronic materials and workmanship shall comply with IPC-A-610, Class 3, current revision.

### Q27 FAA/EASA Documentation

An original FAA/EASA authorized release certificate approval is required to accompany each shipment.

### Q28 Safety Data Sheets (SDS) / Material Safety Data Sheets (MSDS) Requirement

The current SDS/MSDS for material supplied is required for each shipment.

### Q29 Certificate of Origin

Each shipment is to be accompanied by a document, which declares the country of origin on forms acceptable to the originating country's regulations.

### Q30 Purchasing Requirements

Purchasing information shall describe the product to be purchased, including where appropriate the following:

- Requirements for approval of product, procedures, processes and equipment. With the First Article submission, TT Electronics needs to know your procedures, processes and equipment. This data is used in the OEM design.
- Requirements for qualification of personnel. TT Electronics and the OEM need to know that personnel are trained and understand Aerospace requirements.
- Requirements for design, test, inspection, verification (including production process verification), use of statistical techniques for product acceptance, and related instructions for acceptance by the organization, and as applicable critical items including key characteristics. TT Electronics and the OEM need to know your Company's processes, inspection points, tooling, calibration, key characteristics and all requirements listed are being performed per the approved process.
- Requirements for test specimens (e.g. production method, number, storage conditions) for design approval, inspection/verification, investigation or auditing, final inspection and final test verification.
- Requirements regarding the need for the supplier to
  - Notify the organization of nonconforming product. TT Electronics needs to know when you make bad product or parts.
  - Obtain organization approval for nonconforming product disposition. TT Electronics holds MRB disposition rights.
  - Notify TT Electronics of any changes in product and/or process, changes of suppliers, changes of manufacturing facility location and, where required, obtain organization approval, and any changes from the original FAI processes, equipment, your sub-tier suppliers, quality management, and top management, manufacturing change ownership or location. TT Electronics needs to know and approve.

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- Flow down to the supply chain the applicable requirements including customer requirements. TT Electronics' terms need to be flow down to your suppliers and we need to approve the same.
- Records retention requirements see Q32.

### Q31 Identification and Revision status of Specifications

The current revision of specification(s) called out on the drawing shall be provided by Quality.

Q32 Records retention requirements: Contracts, Quality Records, Inspection Records, Purchase Orders, Management Review Minutes, Planning for Product Realization, Training Records, First Article Inspection Records, Nonconforming Records, Corrective Action Request records, Internal Audits, Third Party Audits, Risk Management Records and Escape and Containment Records. Must maintain for ten (10) years unless change by contract.

Q33 First Article Requirements. First article documentation must include measurement results for all dimensions listed on the print (MIL-I- Bubble print). This must list the actual dimensions measured.

### Q34 First Article requirements for fabricated Items requiring raw material traceability

All items fabricated under this purchase order must be traceable to raw materials used. Please contact the buyer on the PO for the required first article report to be used (TT Electronics form # TT-Custom-AS9102).

- 1) Raw materials used must be identified by lot number, as well as material type, specification, heat number, etc., and must be traceable to records of acceptance.
- 2) All records must be maintained on file by the supplier for a minimum ten years. Supplier shall notify TT Electronics prior to the destruction of records.
- 3) This form must accompany first shipment.

### Q35 Counterfeit Work

- 1) For purposes of this clause, Work consists of items delivered under this Purchase Order to the lowest level of separately identified parts (e.g. piece parts, electronic/electrical components and assemblies). "Counterfeit Work" means Work that is or contains items misrepresented as having been designed and/or manufactured under an approved process or method. The term also includes approved Work that has reached a design life limit or has been damaged beyond possible repair, but is altered and misrepresented as acceptable.
- 2) SELLER agrees and shall ensure that Counterfeit Work is not delivered to TT Electronics.
- 3) SELLER shall only purchase products to be delivered or incorporated as Work to TT Electronics directly from the Original Component Manufacturer (OCM)/Original Equipment Manufacturer (OEM), or through an OCM/OEM authorized distributor chain. **Work shall not be acquired from independent distributors or brokers unless approved in advance in writing by TT Electronics.**
- 4) SELLER shall immediately notify TT Electronics with the pertinent facts if SELLER becomes aware or suspects that it has furnished Counterfeit Work. When Requested TT Electronics, SELLER shall provide OCM/OEM documentation provision included in this Purchase Order addressing the authenticity of Work. To the extent such provisions conflict with this clause, this clause prevails.
- 5) SELLER shall include paragraphs A) through E) and this paragraph G) of this clause or equivalent provisions in lower tier subcontracts for the delivery items that will be included in or furnished as Work to TT Electronics that authenticates traceability of the affected items to the applicable OCM/OEM.

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6) This clause applies in addition to any quality provision, specification, and statement of work or other controls, Inc.

Q36 Supplier is required maintain an ISO9001 or AS9100 Quality Management that is registered to an accredited registration body

Q37 The supplier does not have the authority to disposition and ship nonconforming material without preapproval and written authorization from TT Electronics

Q38 The supplier shall ensure persons are aware of

- Their contribution to product and service conformity
- Their contribution to product safety
- Their contribution to ethical behavior

Q39 Fabricated Items

Certification of Raw Materials: All items fabricated under this purchase order must be traceable to raw materials used.

- 1) Raw materials used must be identified by lot number, as well as material type, specification, heat number, etc., and must be traceable to records of acceptance.
- 2) All records must be submitted with each shipment.
- 3) All records must reflect purchase order number.
- 4) Raw Materials used must be periodically validated by Seller or other independent party through periodic, scheduled tests of raw material samples. Frequency of tests will be established by Seller based on historical performance of the raw material supplier.

Q40 Foreign Object Debris/ Damage (FOD) Prevention

Seller shall ensure that applicable FOD prevention programs are in place. By delivering items to Buyer, Seller shall be deemed to have certified to Buyer that such items are free from any foreign materials that could result in FOD.

Q99 None Required

ISSUE	REVISION DESCRIPTION	DATE APPROVED
01	New Form	6/1/12
02	Updated Q10 to state "on 1 <sup>st</sup> shipment" instead of "this order"	7/17/12
03	Added Q32 Record Retention Requirements	8/20/12
04	Added E-Q's for Eaton flow downs	9/7/12
05	Added Q33 1 <sup>st</sup> article requirements.	11/9/12
06	Added Q34 - Reformatted clause numbers to align with customer numbers	6/21/13
07	Updated company logo; minor formatting and clerical changes; no changes were made to any clause;	7/13/16
08	Added clauses Q35, G36, Q37, Q38, Q39 and Q40.	3/16/18