



Q-CODE Q47A QUALITY REQUIREMENTS FOR THE ACCEPTANCE FOR PRINTED CIRCUIT BOARDS (PCB) WITH AS9102

The following are the quality requirements for product purchased under Q-code Q47A. Please reference the Plexus Supplier Quality Manual [DCS 10503](#) for additional details and purchasing requirements. This includes but is not limited to granting the right of access to the supplier's facilities and all applicable records to Plexus, their customers products and regulatory authorities with the acceptance of this Purchase Order, flow down all applicable requirements to sub-tier suppliers including key characteristics and retention of all records for a minimum of 12 years that support the manufacturing, material or testing per the requirements of this Plexus customer. Unless a written waiver is received from Plexus, the supplier agrees to abide by the quality requirements listed in this Q-Code.

AS9100 Certification

The supplier location(s) that perform or outsource the manufacturing/fabrication, product installation, servicing, additional inspection or test, physical re-identification, product assembly, and/or kitting processes, must have the AS/EN/JISQ 9100 certificate "Quality Management Systems Requirements for Aviation, Space and Defense Organizations". All the associated manufacturing processes must be included within the scope of certification. The AS/EN/JISQ 9100 certificate must be certified by an accredited certification body listed in the IAQG Online Aerospace Supplier Information System (OASIS) database. The supplier must evaluate and select distributors based on the distributors' ability to conform to an AS/EN/JISQ 9100, or AS/EN/SJAC 9120 quality management system.

Shipments and handling of Export Controlled Items, Data, or Services

Supplier will be required to comply with and meet the documentation and quality requirements of the Arms Export Control Act, 22 U.S.C 2751-2794, the International Traffic in Arms Regulation (ITAR), 22 C. F. R. 120 - 130, the Export Administration Act, 50 U.S.C. app 2401-2420, the U.S. Customs regulations 19CFR134 and the Export Administration Regulations, 15 C.F.R. 730-774 for this product, all specifications, and associated documentation. This includes, but is not limited to:

1. Export controlled items, data, or services, or any element thereof, will not be exported from the United States without U.S. Government authority and the express written authorization of a Plexus ITAR Empowered Official.
2. Export controlled items, data, or any element thereof, will not be transferred or disclosed to foreign persons including transfer to foreign persons employed by or associated with, under contract to Sub-tier suppliers including transportation carriers.
3. Import Licenses will be provided with all shipments where applicable.
4. Country of Origin Certification. Upon Purchaser's request, supplier will provide the appropriate Certificate of Origin (CoO) within 24 hours. The CoO will state the country of origin for the products being purchased, sufficient to satisfy the requirements of the country of receipt and any applicable export licensing regulation, including those of the United States. If the CoO is a NAFTA country, customs form 434 is required to be used. A copy of this form can be downloaded at <https://www.cbp.gov/document/forms/form-434-north-american-free-trade-agreement-nafta-certificate-origin>. If the CoO is not a NAFTA country, then complete a letter, using company letterhead, certifying the country of origin of the parts being supplied.



1ST PRODUCTION RUN/PRE 1ST SHIPMENT/CHANGE OF PRODUCT - BEFORE A PRODUCT CAN BE RELEASED FOR PRODUCTION, THE SUPPLIER WILL BE REQUIRED TO PROVIDE THESE QUALITY DOCUMENTATION AND REQUIREMENTS.

A. First Article Inspection Requirement

- 1) Supplier will execute the Aerospace First Article Inspection requirements of the SAE standard, AS9102, and provide the results to Plexus with each shipment in which the requirement is to be executed.
- 2) Supplier will be required to meet the documentation and quality requirements as follows:
 - a) Qualification and Performance Specification for Rigid Printed Boards, IPC-6012, Rigid Flex Boards, IPC-A-6013, Acceptability of Printed Boards, IPC-A-600, Qualification and Performance of Permanent Solder Mask and Flexible Cover Materials, IPC-SM-840, and the Department of Defense Standard Practice: Identification of U.S Military Property, MIL-STD-130, unless otherwise specified and will default to Class 3 if class is not otherwise specified.
 - b) Supplier will be required to meet the documentation and quality requirements as follows: IPC-2221, IPC-4101, IPC-4562, IPC-6012, IPC-A-6013, IPC-CC-830B, IPC-9252, IPC-MF-150, IPC-SM-840 (all referenced documents must be to the latest revision).
- 3) Special processes utilized by the supplier will require written approval from Plexus prior to performing for review and approval. If approved, a certificate of conformance is required that includes the applicable name of specification number, type and class of material or process used.
- 4) A representative sample from the lot will be selected and inspected as part of the First Article Inspection.
- 5) Raw materials must have direct traceability with the chemical and physical properties submitted.
- 6) All dimensions and specifications on drawing must be verified to be within print tolerance. Plexus must be contacted and approve any dimension out of print specification in writing before product/parts can be shipped. The FAIR must also include all the applicable inspection tooling/equipment numbers and the calibration expiration dates for the tools and equipment used.
- 7) A bubble diagram indicating all applicable features, characteristics and notes must be provided as part of the FAIR submission.
- 8) Cross-Section, PCB Test Coupon and Cross-Section Report - A minimum of two cross sections must be supplied from every manufacturing panel regardless of layer count and sent to an approved independent third party laboratory for testing. Test reports are to be completed per IPC-6012 or IPC-6013 (latest revision) (as applicable) section 3.6.2, with results sent to Plexus prior to approval of shipment. Tested coupons shall be sent to Plexus for long-term storage.

B. Hyper-corrosion Test Report - For Electroless Nickel with Immersion Gold Coating (ENIG) boards, process controls shall be implemented as per Plexus PCB specification G9000-3. Results and applicable cross-sections shall be retained by the supplier and provide to Plexus on request.

C. Contamination Test Report - Per Plexus PCB specification G9000-3.

D. Provide PCB for Solderability Sample - Include a complete and physically intact PCB or Array as supplied for the Part Number. This should be segregated and boldly identified. The box containing the solder ability sample must also be identified as such.

E. Material Certificates - Include all applicable material certifications.

F. 100% Electrical Testing Certificate - Including an Impedance Report on Impedance Designs per Customer's drawing.

G. Certificate of Compliance

- 1) Must state compliance to all applicable specifications (drawing, PO, customer specifications, Plexus G9000-3, IPC specifications, etc. . .).
- 2) The statement of compliance must include the name and location of the facility that manufactured the Printed Circuit Board/Printed Wiring Board., name of supplier (if not the OEM), supplier and Plexus part numbers with the current revision specified on the Purchase Order.
- 3) The minimum-required date code format shall identify the 2-digit workweek, 2-digit year (YYWW). If the part marking contains a lot and date code, those markings must be traceable to the COC.
- 4) If the product has a shelf life, then report the manufacturing or cure date, batch number, the shelf life and expiration date. The remaining shelf life must be specified in the PO Message Header. The



remaining shelf life must be greater than 70% of the stated shelf life. Any special handling and/or storage requirements must also be included.

- 5) All cartons, packing slips, reports and certificates must have Plexus Part Number, EC level or Revision, quantity and PO Number listed on them Supplier must be NADCAP certified, per MIL-STD-3464.
- 6) If there are any prior agreed to exceptions, deviations and/or concessions, include copies.

All cartons, required documentation, labels, packaging and packing slips must have the Plexus part number, EC level or revision (if applicable), date code(s), quantity, and P.O. number listed on them.

THE DOCUMENTATION AND QUALITY REQUIREMENTS FOR SUBSEQUENT SHIPMENTS - THE DOCUMENTATION LISTED BELOW MUST BE SUBMITTED WITH EACH SHIPMENT. SHIPMENTS RECEIVED WITHOUT THE COMPLETION AND PROPER EXECUTION OF THESE QUALITY REQUIREMENTS IS CONSIDERED NON-CONFORMING AND PLEXUS RESERVES THE RIGHT TO RETURN THE SHIPMENT TO THE SUPPLIER AT THE SUPPLIER.

A. First Article Inspection Report

Supplier will execute First Production Run requirements and provide the results to Plexus with each shipment following any subsequent change that invalidates the previous First Article Inspection result per AS9102. In addition, products/parts held in inventory by the supplier for 2 or more years or not received by Plexus in 2 or more years must have the First Production Run requirements performed to assure no revision change or product/part deterioration during storage. All dimensions and specifications on drawing must be verified and be within print tolerance. Plexus must approve any dimension that is not within print specification in writing before product/parts can be shipped. The FAIR must also include all the applicable tooling/equipment numbers and the expiration dates for the tools and equipment used.

B. Cross-Section, PCB Test Coupon and Cross-Section Report

A minimum of two cross sections must be supplied from every manufacturing panel regardless of layer count and sent to an approved independent third party laboratory for testing. Test reports are to be completed per IPC-6012 or IPC-6013 (latest revision) (as applicable) section 3.6.2, with results sent to Plexus prior to approval of shipment. Test coupons shall be sent to Plexus for long-term storage.

C. Hyper-corrosion Test Report - Same requirements as B above.

D. Contamination Test Report - Same requirements as C above.

E. PCB for Solderability Sample - Same as D above.

F. Material Certificates - Same requirements as E above.

G. 100% Electrical Testing Certificate - Same requirements as F above.

H. Certificate of Compliance - Same requirements as G above.

All cartons, required documentation, labels, packaging and packing slips must have the Plexus part number, EC level or revision (if applicable), date code(s), quantity, and P.O. number listed on them.

The above listed required documentation must be submitted with each shipment. Shipments received without the completion and proper execution of these Quality Requirements is considered non-conforming and Plexus reserves the right to return to the supplier at the supplier's expense.

PRODUCT CHANGE NOTIFICATION

Product or Process change notification requests (PCNs) shall be submitted to pcns@plexus.com, please reference the details of our PCN policy and requirements in the Plexus Supplier Quality Manual DCS 10503.



REVISION HISTORY

REV	RELEASE DATE	ORIGINATOR	DESCRIPTION OF CHANGE(S)	REASON FOR CHANGE(S)
A	02Jan2020	Tony Nguyen	New - Initial Release	New
B	14Oct2020	Elise Tilton	Added 6013, changed wording for the one piece used for the FAI, added the requirement for 2 cross sections, removed Nadcap requirement and updated the document format.	Updated q-code to coincide with customer flow-downs and industry standards. Clarified Plexus' micro sectioning requirements.
C	22Dec2020	Elise Tilton	Change date code format from WWYY to YYWW.	Updated date code format on certificate of conformance to match the customer drawing requirements.