Microboard Supply Chain Quality Requirements

The following requirements apply to ALL suppliers of material purchased by Microboard. Exceptions for a particular clause are identified within the clause

A. The supplier shall grant Right of Access to Microboard, our customers, and to any regulatory authority, to all applicable areas of all builds at any level of the supply chain involved in the order and to all applicable records

B. The supplier shall notify Microboard of ANY changes that affect the ability of the purchased product/service to meet specified purchase requirements. Additionally, significant changes to process, critical suppliers, ownership, executive management, and Manufacturing facility location need to be reported to Microboard. This requirement pertains to custom parts ONLY. Commercial off-the-shelf (COTS) electronic components are exempt

C. The supplier shall maintain a Quality Management System (QMS). Preferred QMS systems include ISO-9000, ISO-13485, AS9100, or any other equivalent, industry recognized; QMS modeled after military, medical, commercial, and/or international specifications

D. The supplier shall ensure the competence of personnel, including any certifications that may be required in order to assure product Quality

E. Suppliers are expected to maintain an average minimum Quality level of 98.5% and On Time Delivery (OTD) rate of 95%

F. Microboard, or our customer, may elect to perform verifications and/or validations such as on-site Source Inspection on the purchased product or service, prior to delivery by the supplier. The supplier shall grant right of access to all appropriate personnel

G. Since Microboard does NOT grant MRB Authority for product REPAIR, the supplier shall notify Microboard whenever parts are rejected AND are dispositioned for REPAIR. The supplier can perform REWORK at will without having to notify Microboard for approval. ***REPAIR*** is defined as ***"The act of restoring the functional capability of a defective article in a manner that precludes compliance of the article with applicable drawings or specifications." REWORK*** is defined as ***"The act of reprocessing non-complying articles, through the use of original or alternate equivalent processing, in a manner***

that assures compliance of the article with applicable drawings or specifications." This requirement pertains to custom parts ONLY. COTS electronic components are exempt from this requirement

H. The supplier shall maintain test and inspection records for all delivered lots. The term of the record retention shall be specified in the Microboard PO. If no term is specified, the vendor shall maintain ALL Quality records for a period of not less than ***one*** year

I. Suppliers of ***custom*** components shall provide Microboard with a First Article Report (FAI) with the

1. First shipment of a new part
2. A revision change to an existing part, or
3. Whenever an existing part/revision has not been built in more than 2 years

The FAI shall be modeled after the AS9102 format although an FAI of the vendors choosing is acceptable provided that the PO does not specifically call out an AS9102 format. If the PO requires an AS9102 FAI, the ONLY acceptable format for the FAI shall be the AS9102 format. This requirement pertains to custom parts ONLY. COTS electronic components are generally exempt from this requirement unless the Microboard PO specifically invokes it

J. The supplier shall perform an appropriate level of inspection and test. For custom product, a 100% outgoing inspection is preferred. In lieu of 100% inspection, the supplier may perform a C=0, 0.65 AQL, or tighter inspection. Unless defined to the contrary by PO, testing shall be performed only at a 100% level. Test sampling is ***NOT*** acceptable. This requirement does ***NOT*** pertain to COTS components which shall be inspected and tested in accordance with best commercial practices

K. A Certificate of Compliance (C of C) shall be provided with each shipment of product. As a minimum, the C of C shall define the manufacturers name and part number, the part revision (if the part is rev controlled), the quantity, the Microboard PO number, the part serial numbers (if parts are serialized), a statement detailing the compliance of the parts to the relevant drawings, specifications, etc, a RoHS declaration (for RoHS components), along with the name, signature, and date of the person authorizing the release of the material

L. Any special requirements not addressed in this document shall be detailed in the Microboard PO

M. Suppliers of electronic components shall have a Counterfeit Electronic Component Detection and Avoidance system in place to prevent the introduction of counterfeit components into the supply chain. The system shall be modeled after AS5553, including

all paragraph 3.1 requirements. The system shall also be compliant with DFARs 252.246-7007. This requirement pertains ONLY to suppliers of electronic components.

N. To better control counterfeit electronics, Microboard does NOT accept electronic components from Original Component Manufacturers (OCM) and/or Franchised Distributors (FD) that were formerly shipped to a different customer and were subsequently returned to the OCM and/or FD. Exceptions may be made on a case by case basis, with approval from Microboard's customers, via Microboard's Procurement Group

O. Conflict Minerals (3TG) Requirements - Microboard Processing Incorporated (Microboard) is fully committed to support the initiatives set forth by the Dodd-Frank Act, to ensure that T3G "conflict minerals" (Gold, Tantalum, Tin, and Tungsten) used in components which we purchase from our suppliers do not directly or indirectly finance or benefit armed groups in the Democratic Republic of the Congo (DRC) or adjoining countries, committing atrocities and human rights abuses. Microboard requires our suppliers to support this initiative by:

1. Agreeing to conduct your business in conformance with the Responsible Business Alliance (RBA) **Code of Conduct** version 7.0 (2021) requirements.

2. Exclusively sourcing from smelters /refineries which have been independently audited and certified as "conflict-free" of the T3G minerals

3. Implementing a system that allows you to determine the origin of conflict minerals (gold, tantalum, tin, or tungsten) in the products that you manufacture or contract to manufacture

P. Unless stated to the contrary in the PO or provided drawings, workmanship criteria for printed circuit assemblies and cable/harness assemblies shall be in accordance to IPC-A-610, and IPC-WHMA-A-620, class 3, respectively

Q. Many Microboard programs are subject to ITAR rules and regulations; therefore, ALL documentation supplied by Microboard shall be treated in accordance with the requirements defined by the various ITAR CFR's. For the latest ITAR regulations, suppliers are encouraged to visit the US Department of State Directorate of Defense Trade Controls web page at https://www.pmddtc.state.gov/

R. Suppliers who use sub-contractors to perform some/all aspects of the overall build of custom products are responsible for flowing down all Microboard requirements to the sub-tier suppliers. The supplier Microboard issued the PO to is ultimately responsible for the compliance of the finished part to all Microboard requirements

S. Supplier personnel shall be made aware of the following:

1. Their contribution to product/service conformity
2. Their contribution to product safety
3. The importance of ethical behavior

T. Active and passive components shall NOT be older than 3 years (as evidenced by the components date and/or lot code) when shipped by the supplier without *PRIOR* approval from Microboard Purchasing

Additional Requirements for Printed Circuit Board Suppliers

1. Unless defined to the contrary by Microboard Engineering or within Microboard's PO, by default, Microboard requires all pc boards to be manufactured in a panel array. The PCB vendor is responsible for generating the array, getting the array approved by Microboard Engineering PRIOR to building the fabs, and for supplying a copy of the final, approved, array drawing to Microboard Engineering and Documentation Control through the Microboard Purchasing contact

2. If an AS9102 First Article (FAI) is required by PO, the fab vendor MUST include a ballooned panel array drawing, as applicable, and the related notes/dimensions on Form 3 of the AS9102 FAI form. This requirement also applies to ALL other drawings (fabrication drawings, outline drawings, etc.) supplied to the fab vendor at the time of order placement

3. Once the fab vendor has determined the stackup for a multilayer board, they shall forward a copy of that stackup to Microboard Program Management via the Microboard Purchasing contact for approval by the customer. The job shall NOT begin build at the fab shop without an approved stackup

4. All new fab part numbers or new revisions of existing fab part numbers require a formal DFM review (Design For Manufacturability) to be submitted by the fab vendor to Microboard Engineering via their Microboard Purchasing contact. The DFM shall include all issues identified during the Engineering, Build, Testing and Inspection of the fabs. The DFM should be received by Microboard at approximately the same time as the first delivery of the subject fabs

5. If the fab vendor modifies the outer layer artwork to accommodate material movement, etc., the vendor shall supply Microboard Engineering with a set of the modified Gerbers containing those modifications. The Gerbers will be used to generate stencils, programs, etc. at Microboard

6. Special testing requirements (IST, Air To Air, etc.) shall be defined on the Microboard PO. The fab vendor, our customer, and Microboard shall work together to define the sample size, coupon design, test parameters, number of coupons, report content, cost, schedule, etc. PRIOR to the fabs being released for build

7. Many Microboard programs are government rated as DX/DO and as such, the fab vendor shall prioritize the running of these boards through their facility. Program ratings are defined on Microboard's PO. The vendor shall notify Microboard immediately if a rated product will be delayed for ANY reason

8. Printed Circuit Board workmanship shall be verified against the requirements specified in the customer blueprints or specifications. In the absence of customer defined criteria, Microboard's default criteria shall be IPC-A-600, class 2, or as otherwise specified within the PO.

9. Unless defined to the contrary on the PCB fab drawing or other supplied customer documentation, the following represents the minimum data requirement that all fab vendors need to supply with each lot of boards delivered to Microboard.

    A. Certificate of Conformance (C of C) stating that the fabs meet all requirements specified in the fabrication documentation and/or the PO. The c of C must be signed by the company's Quality representative.
    B. Test certification defining the test voltage, test current (if applicable), and the resistance limits for shorts and opens
    C. Material certs for laminate, prepreg, and foil as defined in the PCB fabrication drawing
    D. Soldermask cert
    E. Silkscreen ink cert
    F. Cert for the via fill medium, if the fabrication drawing requires via holes to be filled.
    G. Impedance data if the board has impedance control defined in the fabrication documentation
    H. X-section report showing the actual measured values for all stackup parameters such as copper foil thickness, plated copper thickness, dielectric thickness, core vs. prepreg etc.
    I. IPC-6012 checklist showing all of the parameters the board was verified against and that the lot passed for those parameters
    J. Any other special requirements