

F-099 Quality Code Flow Downs for Purchase Orders RELEASE DATE: 6/29/2026

Quality Code Flow Downs for Purchase Orders

Q Attachment	Requirement	Detailed Requirement
Q1	General Quality Requirements	General Quality Requirements
	Standard CoC (Certification of Conformance) & COO (Country Of Origin)	The following statement, or equivalent, must be included with each shipment, signed and dated by a company representative. I certify this product meets all purchase order requirements, reference PN(s), quantities, lot #'s, and/or SN's log and Country Of Origin.
	Records	Records of manufacturing, testing, processing, inspection, packaging, and shipping shall be retained for a minimum of 12 years. Records shall be made available for review on request.
	Counterfeit Parts Mitigation	The supplier and its' sub-tier suppliers shall ensure that only new materials are used in products required to be delivered to Aethercomm. Electronic components shall be procured from the OEM/OCMs or their Franchised (licensed) Distributors. No electronic components shall be purchased through or from Non-Franchised Distributors or Brokers without express written approval from Aethercomm Purchasing and Quality Management. The Supplier shall include and flow down this requirement to all sub-tiers for raw materials, electronic parts, or assemblies.
	Competence, Training and Awareness	The supplier shall ensure personnel processing orders or performing work affecting conformity to product or service are trained and aware of the relevance and importance of their activities in relation to meeting the requirements of Aethercomm purchase orders and associated documentation
	Product Safety & Ethical Behavior	The supplier shall ensure personnel processing orders or performing work affecting conformity to product or service are aware of their contribution to product safety and the importance of ethical behavior.
	Right of Access	Right of access shall be given to Aethercomm, our customer and regulatory authorities to the applicable areas of all facilities, at any level of the supply chain, involved in the order and to all applicable records
	Aethercomm/Customer Requirements Flow Down	Aethercomm will flow down Customer requirements to Suppliers within Notes added to the Purchase Order. Aethercomm Suppliers shall flow down Aethercomm/Customer requirements to their sub-tiers.
	Interactions with Aethercomm	All Supplier Interactions with Aethercomm should be initially coordinated through Purchasing.
	Provide Test Specimens	When noted on the Purchase Order, Supplier shall provide test specimens for design approval, inspection/verification, investigation, or auditing.
	Inspection & Test System	Inspection & Test System must be in place that ensures contract requirements will be fulfilled.
	Quality Program	Supplier must have a Quality Program Requirements system in place that ensures contract requirements will be fulfilled
	Non-conformance	A system shall be in effect for the control of material nonconforming to drawings, specifications or other purchase order requirements as per AS9100. If not certified to AS9100, Supplier shall segregate non-conforming material from conforming.
	Shipping Insurance	Carrier shipping insurance is required for shipment of expensive parts in excess of \$3,000.
	Foreign Object Debris (FOD)	Supplier shall establish procedures to control and eliminate Foreign Object Debris and contamination in a manner to lower risk potential throughout the entire process. Procedures or policies developed by Supplier shall be subject to review and audit by Aethercomm or their customers as required.
	Special Packaging	A specification or instruction will be called out in the Purchase Order for special packaging of material when required.
	No-Clean Solder Paste, Flux	The use of no-clean solder paste/flux is prohibited. The use of no-clean paste/flux is acceptable if residue is removed. Should manufacturer's recommendation state that residue should not be cleaned, then the use of the specific paste/flux is prohibited.
	Electrostatic Discharge Protection	For the contractual requirements of parts that are ESD sensitive, Supplier shall have an Electrostatic Sensitive Discharge (ESD) control program subject to review and approval by Aethercomm upon request.
	Approved Process Sources	Supplier shall use only Aethercomm approved sub-tier suppliers that can meet the specification of the awarded Purchase Order. A listing of Approved Suppliers will be provided by Aethercomm Purchasing. A certification from the Supplier shall be forwarded with each shipment.
	GD&T	Unless otherwise specified, dimensioning and tolerancing shall be in accordance with ASME Y14.5 2009. Special attention should be given to section 1.4n which states "Unless otherwise specified, all tolerances apply for the full depth, length and width of the feature".
Q2	Review Q Codes	Review Quality Codes (at https://www.aethercomm.com/quality-clauses) prior to responding to Aethercomm RFQ (Requests For Quote), during Contract Review after receipt of order and prior to shipment to verify compliance with the latest requirements
	Compliance Responsibility	FAI approval does not relieve the Supplier of the responsibility and/or liability for full compliance with all contract requirements.
	Vendor Chargeback	The purpose of Aethercomm's Vendor Chargeback requirement is to help ensure that Vendors comply with Aethercomm's quality requirements. Aethercomm holds the Vendor accountable for certain violations and financial penalties will be assessed for non-compliance. Shipments not in conformance with Aethercomm guidelines may be refused and returned at Vendor cost or may be assessed a chargeback. Chargebacks may be issued for damage related to insufficient packaging and Vendor-related quality concerns. Approved chargebacks will be deducted from a future invoice as damages. All questions and concerns regarding chargebacks must be addressed with Aethercomm's Supplier Quality Engineer.
Q2	Configuration Control	If the supplier makes any Class 1 (fit, form, or function) or Class 2 (other than clerical) changes they must notify the Aethercomm Quality Management in writing before the change is implemented. All Class 1 changes require Aethercomm Quality Management approval. This includes any and all process changes required to build the component being purchased.

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Q3	First Article Required	As requested on the Purchase Order, suppliers shall submit a First Article Inspection Report (FAIR) that records all inspection measurements, notes, material(s), process(es) on SAE AS9102 format. The FAIR shall reference the Purchase Order number and must accompany the FAIR item(s). Item(s) undergoing FAI shall be identified as FAIR item prior to shipment. All items/assemblies shall have been manufactured using the same production processes and equipment which will be used in fulfilling the contract. The criteria to perform a FAIR is: •Initial fabrication of parts •Parts have not been fabricated in two years •Engineering drawing has been revised since parts were last fabricated (only partial FAIR is required) The documentation shall include: •Bubbled drawing •Certifications/mil reports for raw material as applicable •Special process certifications from sub tier suppliers i.e. heat treat, chemfilm, anodize, conformal coat, etc as applicable. Contract Manufacturing for assembly of PCBA/CCA CM's awarded turn-key orders are required to flow down FAIR requirements to sub-tier suppliers (printed circuit boards, metal fabrication, cable assemblies, etc.).
Q4	Source Inspection	When listed on the purchase order, Source Inspection must take place before shipment of product to Aethercomm, typically for FAI, or as imposed on Supplier by Aethercomm Quality Management, which will provide notification when required.
Q5	Deleted	Not used at this time.
Q6	Shelf Life	Product must be clearly identified with applicable manufacture & expiration dates. All material must have at least 75% of the storage life remaining upon receipt.
Q7	Use-As-Is & Repair	Use-As-Is and Repair are not allowed unless Aethercomm approval is obtained in advance by a signed waiver.
Q8	ISO 9001	Current Certification by an accredited 3rd party required when listed on the Purchase Order
Q9	AS9100	Current Certification by an accredited 3rd party required when listed on the Purchase Order
Q10	Nadcap	Nadcap accreditation -When required Special Process accreditation type will be listed on the Purchase Order
Q11	Raw Material-Physical and Chemical Analysis	Include raw material certifications with shipment that includes a copy of the detailed report of the physical and chemical analysis Contract Manufacturing: Raw material certifications for fabricated parts (i.e. metal parts) shall be kept on file and available for review when requested
Q12	Clean, oil free	Products shall be clean and free from any residue including but not limited to oil, flux, contamination, and any type of foreign object debris.
Q13	Acceptance Test Report	Include with each shipment a true copy, signed by a responsible representative of the supplier of the result of the lot or item acceptance tests required by the applicable specification. The report shall indicate the actual values obtained.
Q14	Calibration Method	Calibration must meet a minimum of ANSI/NCSL Z 540 and AS9100. This includes: •A certificate of calibration shall be delivered to Aethercomm showing the components outlined in ANSI/NCSL Z540 (most current version) Certificates and Reports with traceability to reference standards. •In the event of an Out-Of-Tolerance condition, the calibration supplier shall notify Aethercomm promptly •The supplier shall maintain calibration records for a minimum of 12 years •Should repairs be done on a piece of calibrated equipment, the specific repair shall be described by the calibration supplier. See purchase order for any additional information
Q15	Secondary Processes	Include the Aethercomm P.O. number on all documents relating to secondary processes (plating, machining, etc.). Subcontract Assembly and Manufacturing companies - certifications for secondary processes shall be maintained on file for 12 years and available upon request.
Q16	Packaging Bag & Tag - Bulk	When material is not sensitive to shipping or handling damage, the entire lot must be bagged/boxed, and the bag/box must be identified. Parts must not be co-mingled with different part numbers or different lot numbers
Q17	Packaging Bag & Tag-Individual	When material is sensitive to shipping or handling damage the entire lot must be bagged/boxed, and the bag/box must be identified. Parts must not be co-mingled with different part numbers or different lot numbers Parts must be individually wrapped/segregated to prevent contact with each other. All silver-plated parts shall be packaged with anti-tarnish material such as but not limited to 'Silver Saver Paper'.
Q18	IPC-6012 & IPC-A-600 (Latest Revisions)	Suppliers shall adhere to the latest revisions of IPC-6012 & IPC-A-600.
Q19	IPC-6012 Space & IPC-A-600 (Latest Revisions)	Suppliers shall adhere to the latest revisions of IPC-6012 Space & IPC-A-600S.
Q20	Electrodeposited Copper Test Frequency: Monthly	When copper plating is specified, electrodeposited copper plating shall meet the following criteria: a) When tested as specified in IPC-TM-650, Method 2.3.15, the purity of copper shall be no less than 99.50% b) When tested as specified in IPC-TM-650, Method 2.4.18.1, using 50-100um [1,969-3,937 uin] thick samples, the tensile strength shall be no less than 275.8 MPa [40,000 PSI] and elongation shall be no less than 18%.

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Q21	Prohibited Material	The following materials shall not be contained in any deliverable product except where specified on drawing or material specification: • Pure, unalloyed cadmium or alloys containing 5 percent by weight or greater cadmium not completely over-plated by a Buyer approved material. • Pure, unalloyed zinc or alloys containing 20 percent by weight or greater zinc not completely over-plated by a Buyer approved material. • Compound (e.g., plating, paint, other surface finishes) containing greater than 1 percent by weight of cadmium or zinc. Only applies to EEE components; excludes connectors, contacts, wire, lugs, and other mechanical or structural components. • Corrosive solder fluxes, unless detailed cleaning procedures are specified, along with appropriate verification methods to insure removal of residual contaminant. • Pure tin, or >97 percent tin by weight, internally or externally. Tin-Lead finishes and connections shall be alloyed with a minimum of 3 percent lead (Pb) by weight. Note that Sn96/Ag4, Au80Sn20, and Sn95/Sb5 are standard solder-attach materials used in high temperature soldering applications and are acceptable for those applications only. • Magnesium or selenium shall not be used unless inside a hermetically sealed device. • Mercury, alloys of mercury, or compounds of mercury. • Materials exhibiting or known to exhibit natural radioactivity such as uranium, potassium, radium, thorium, and/or any alloys thereof. • Materials exhibiting or known to exhibit health hazards such as unalloyed beryllium, toluene, lithium, and/or any alloys thereof. • Gold plating over silver without a nickel barrier coating, silver under plate on gold contacts and silver-plated terminals and contacts, except movable contacts.
Q22	PCB Metal Finishing Application	External plating shall be such that it shall not promote the growth of whiskers or dendrites and shall not sublime in the intended application conditions and shall adhere to the print driven finish conforming to: IPC-4552 Specification for Electroless Nickel/Immersion Gold (ENIG) Plating for Printed Circuit Boards. IPC-4553 Specification for Immersion Silver Plating for Printed Circuit Boards. IPC-4554 Specification for Immersion Tin Plating for printed Circuit Boards. IPC-4556 Specification for Electroless Nickel/Electroless Palladium/Immersion Gold (ENEPIG) Plating for Printed Circuit Boards. This requirement is applicable when driven by print note for a metal finish and is called out by design. Follow the thickness requirements detailed in the applicable IPC specification and only utilize the print for type of finish. All products shall be compliant to the IPC specification and have a standard certification of conformance as a deliverable, as well as a XRF report to support the compliance.
Q23	Workmanship	Suppliers shall adhere to the latest J-STD-001, J-STD-001S Space addendum, IPC-A-610, IPC/WHMA-A-620 and IPC/WHMA-A-620S Space addendum as applicable.
Q24	Deleted	Not used at this time.
Q25	PCB Testing Labs	When IPC testing is required as detailed in these Aethercomm Quality Codes, Suppliers can perform these tests internally if they have existing facilities and qualified personnel. If Supplier has no internal testing capability for IPC requirements, they shall utilize testing labs identified in http://www.ipc.org/4.0_Knowledge/4.1_Standards/test/testing_labs.htm or approved by Aethercomm Quality Management. If a Supplier doesn't have a lab preference, Aethercomm recommends using Preferred Testing Labs. Information can be found at http://preferredlabs.com/index.html. Suppliers should absorb the cost for required IPC testing, Aethercomm will not pay additional lab fees.
Q26	Cables - Inspection/Test Data	Seller shall perform and document 100% continuity check for all DC cables. Documentation shall indicate acceptance by seller's stamp (or signature) and date performed.
Q27	Ground Pad Solder Voids	There is to be no more than 20% solder voiding under any ground pad. X-Ray evidence FA (First Article), MA (Middle Article) and LA (Last Article) that assures compliance to the specification shall be retained for 12 years and made available to Aethercomm upon request. Note: If during assembly Contract Manufacturers have difficulty meeting the above requirement, pre-forms may be utilized at Supplier's discretion to achieve the requirement.
Q28	Serialization	CCA/PCBA Manufacturers Products shall be serialized and barcoded on an ESD-safe label in a manner in which the printed serial number characters shall be legible, scannable, and visually readable to the human eye. A list of mandated serial numbers shall be provided during placement of the purchase order. If utilizing 2D matrix, QR code, or similar, and should intended surface area be insufficient, the supplier shall affix the last 3 characters/digits on the label. Unless otherwise stated on the drawing, barcode labels shall be applied on the TOP side of the CCA/PCBA in such a way that does not interfere with the assembly of the product. If unable to comply, please contact Frontgrade Aethercomm for review. <i>A sheet with the full serial numbers and scannable barcodes shall be submitted with each shipment.</i> Machined/Fabricated Metal Parts Serialization is not required.
Q29	Excess Solder	Excess solder/solder projections/solder splash present on the bottom side of the PCBA shall be wicked flat as to not impede the assembly and/or function of the product.
Q30	PCB Packaging	PCB Fabricators may utilize bulk/brick packaging methods with no more than stacks of 10 slip sheeted PCBs, with Desiccant Packets included. Or individually bagged in bundles of 5 or 10, depending on size and configuration of PCB, with Desiccant Packets included. All silver-plated parts shall be packaged with anti-tarnish material such as but not limited to 'Silver Saver Paper'. Stiffeners Shall be utilized to protect array configurations, scored material, hybrid designs with potential for flexing or railed configured PCBs subject to breakage. Suppliers shall utilize special packaging/stiffeners to insure compliant product upon delivery.
Q31	PCB Cleanliness & Ionic Contamination Report	Printed boards shall be tested in accordance with IPC-TM-650 Method 2.3.25 or equivalent methods with equal or better sensitivity and employ solvents with the ability to dissolve flux residue and other contaminants. An Ionic Contamination Cleanliness Report shall accompany shipment paperwork and shall be retained for 12 years. Test results must be under IPC fail point of 10.06 ug NaCl/sq".
Q32	Surface Mount Electronic Component Placement	Surface mount electronic components including but not limited to SMD resistors and SMD capacitors shall be installed flat per J-STD-001 Class 3 requirements, unless otherwise called out on drawing.

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Q33	CCA Requirements	CCA Sub Contractor shall: • Provide Lot Code or Date Code, serialization and C of C. • Provide Lot Track Information Report with each deliverable shipment in accordance with Q40-General, Q41-Batch or Q42-Single Piece Flow Lot Traceability as applicable. • Provide PCB Requirements as listed in Q35 when Turn-Key is specified by Aethercomm Purchase Order
Q34	FBGA (Fine -Pitch Ball Grid Array)	FA (First Article), MA (Middle Article) and LA (Last Article) shall be utilized for methodology validation. X-Ray evidence that assures compliance to the specification shall be retained for 12 years and made available to Aethercomm upon request.
Q35	PCB Requirements	PCB Sub Contractor shall: • Provide Lot Code or Date Code, serialization and C of C. • Retain Class 3 coupons, solder-ability coupon (Solder Float) & provide to Aethercomm upon request. Following shall be delivered from each lot manufactured. 1. Reports: Copies of your internal data-report for; Lab Cross Section report Electrical Test C of C Impedance Test Report (when applicable) 2. Solder Sample
Q36	Space Requirements Commercial	• C of C (Certificate of Conformance) on Completed unit. • Assemblers and Inspector shall have valid IPC Space certification to IPC J-STD-001S and IPC/WHMA-620S • Any additional Contract specific requirements will be specified in Purchase Order Notes.
Q37	Space Requirements Standard	• C of C (Certificate of Conformance) on Completed unit. • C of C (Certificate of Conformance) for each part installed. • C of C (Certificate of Conformance) from all Aethercomm Supplier builds and/or testing. • Assemblers and Inspector shall have valid IPC Space certification to IPC J-STD-001S and IPC/WHMA-620S • Any additional Contract specific requirements will be specified in Purchase Order Notes.
Q38	Space Requirements Critical	• C of C (Certificate of Conformance) on Completed unit. • C of C (Certificate of Conformance) for each part installed and shall include the Lot Trace Code. • C of C (Certificate of Conformance) from all Aethercomm Supplier builds and/or testing. • Assemblers and Inspector shall have valid IPC Space certification to IPC J-STD-001S and IPC/WHMA-620S • Photos required based on contract requirements provided by Aethercomm Supplier Quality Engineer. Photo Requirements: 1. High Resolution (24 megapixel photos, 6000 X 4000 image dimensions). 2. Within pictures include a metal ruler adjacent to the part for scale reference. 3. Within pictures include an identification template with contract specific information. 4. Photos of CCA/PCBA shall be of both sides. When conformal coat is required, before and after photos. 5. Photos of Sub Assembly shall be all six sides. • Any additional Contract specific requirements will be specified in Purchase Order Notes.
Q39	PCB Design Selection Characteristics	During design phase for PCB materials and their characteristics, Aethercomm utilizes careful selection methodology. No Supplier modifications of print selected materials along with their selected dissipation constant (Dk) and dissipation factor (DF) attributes are allowed. Aethercomm products are designed for RF applications and any alterations are disastrous. If supply chain wishes to build material, it must be done in a manner to mimic the OEM attributes.
Q40	General Lot Traceability	The Supplier or their sub tiers shall provide documentation that maintains OEM (Original Equipment Manufacturer) traceability for materials/components used in the manufacture of Aethercomm part numbers. At minimum, documentation shall include OEM name, part number, CoC (Certificate of Conformance), and COO (Country of Origin). With the exception of COTS: Commodities/Parts generally purchased out of a Catalog/Website such as Grainger, McMaster Carr, supplies from Home Depot, Non-Military/Space EEE or Non-Military/Space fasteners, Hardware shall only be traceable to the rewarded Purchase Order by Aethercomm.
Q41	Batch Lot Traceability	The Supplier or their sub tiers are required to trace the lot/date code or serial number for each traceable part used on the assembly to the assembly batch lot (work order/job number). Allows Aethercomm to trace the lot / date code or serial number of each traceable part on the BOM (Bill of Material) utilized during the assembly process, to the assembly work order or job number utilized for manufacturing build opportunity at CM/EMS - Contract Manufacturer or Electronic Manufacturing Services and sub-suppliers. Q41 also includes the requirements of Q40 General Lot Traceability.
Q42	Single Piece Flow Lot Traceability	The Supplier or their sub tiers are required to trace the lot/date code or serial number for each traceable part used on the assembly to the individual assembly serial number level. Allows Aethercomm to trace the lot/date code and serial number of each traceable part on the BOM (Bill of Material) utilized during the assembly process, to the individual assembly serial number level. All assembly processes within the CM/EMS and sub-suppliers processing loop shall be set-up in a way that links the unique identities of raw material inputs to that of the assembly serial number. Q42 also includes the requirements of Q40 General Lot Traceability & Q41 Batch Lot Traceability.
Q43	Threaded Inserts	When a callout for threaded inserts are to be utilized, the following shall be adhered to, THE INSERT SHALL COMPLY TO NAS1130 SPECIFICATIONS, WHEN ASSEMBLED IN A TAPPED HOLE AS SPECIFIED IN MS3537, SHALL PRODUCE A FINISHED THREAD MEETING THE REQUIREMENTS OF FED-STD-1128/2 AND ACCEPT AT A MINIMUM EXTERNAL THREADED PARTS WHICH CONFORM TO MIL-S-7742 OR MIL-S-8879.
Q44	FGA Acceptance Test Procedures	When provided, supplier shall implement FGA's acceptance test procedure (ATP) to validate test set up and process units under test (UUT).
Q45	Date Code-2.5 Years	Components shall not have a date code (YYWW) exceeding 2.5 years prior to FGA receipt
Q46	Date Code-4 Years	Components shall not have a date code (YYWW) exceeding 4 years prior to FGA receipt
Q47	Date Code-6 Years	Components shall not have a date code (YYWW) exceeding 6 years prior to FGA receipt
Q48	Date Code-9 Years	Components shall not have a date code (YYWW) exceeding 9 years prior to FGA receipt
Note: If Suppliers have any Quality Issues or Questions (QIQ) regarding these Quality Codes, please email to AethercommDPGQuality@frontgrade.com		