Quality Clauses

Commodity Applicable Q Code List

Note: Review each commodity being supplied, then adhere to the requirements based on each applicable Q code.

Category	Commodity	Q Code
Metal	Aluminum housings, heat sinks, parts (Non-Space)	Q1, Q2, Q3, Q7, Q12, Q21, Q40
	Aluminum housings, heat sinks, parts (Space)	Q1, Q2, Q3, Q7, Q12, Q21, (Q36 or Q37 or Q38 for type of Space job, will be identified on Purchase Order), Q40
	Outside Machining	Q1, Q2, Q3, Q7, Q12, Q40
	Sheet Metal Parts	Q1, Q2, Q3, Q7, Q12, Q40
	Aluminum, Steel, Brass	Q1, Q11, Q21, Q40
	Silk Screening	Q1, Q15, Q40
	Anodizing	Q1, Q15, Q21, Q40
	Chem. Film	Q1, Q15, Q21, Q40
	Plating, Gold, Etc.	Q1, Q15, Q21, Q40
	Silver	Q1, Q15, Q17, Q21, Q40
PCB	Bare Printed Circuit Boards (Non-Space)	Q1, Q2, Q3, Q6, Q7, Q18, Q20, Q21, Q22, Q25, Q30, Q31, Q35, Q39, Q40
	Bare Printed Circuit Boards (Space)	Q1, Q2, Q3, Q6, Q7, Q19, Q20, Q21, Q22, q24, Q25, Q30, Q31, Q35, Q39 (Q36 or Q37 or Q38 for type of Space Job, will be defined on Purchase Order), Q40
	Flex Printed Circuit Boards (Non Space)	Q1, Q2, Q3, Q6, Q7, Q18, Q20, Q21, Q22, Q25, Q30, Q31, Q35, Q39, Q40

	Flex Printed Circuit Boards (Space)	Q1, Q2, Q3, Q6, Q7, Q19, Q20, Q21, Q22, Q24, Q25, Q30, Q31, Q35, Q39 (Q36 or Q37 or Q38 for type of Space Job, will be defined on Purchase Order), Q40
Contract Manufacturing	Contract Manufacturing (Printed Circuit Board Assembly)	Q1, Q2, Q3, Q6, Q7, Q11, Q12, Q21, Q23, Q25, Q27, Q28, Q29, Q32, Q33, Q34, Q35 (If Space Job, Type Q36 or Q37 or Q38 will be identified on Purchase Order), Q40
Electronic Parts	Capacitors	Q1, Q16, Q17, Q21, Q40
	Connectors	Q1, Q16, Q17, Q21, Q40
	Filters	Q1, Q16, Q17, Q21, Q40
	I.C.s	Q1, Q16, Q17, Q21, Q40
	Inductors	Q1, Q16, Q17, Q21, Q40
	Loads	Q1, Q16, Q17, Q21, Q40
	Regulators	Q1, Q16, Q17, Q21, Q40
	Resistors	Q1, Q16, Q17, Q21, Q40
	Source Control Document Purchases	Q1, Q13, Q16, Q17, Q21, Q40
	Transistors	Q1, Q16, Q17, Q21, Q40
	Switches	Q1, Q16, Q17, Q21, Q40
Cables	RF and DC	Q1, Q2, Q3, Q21, Q26, Q40
Space Requirements	Noted requirements and information is required to accompany the received material. Applies to all levels of Space jobs – Q36 Commercial, Q37 Standard & Q38 Critical.	Q1, Q16, Q17, Q19, Q21, Q23 (Q36 or Q37 or Q38 for type of Space job, will be identified on Purchase Order), Q40
Miscellaneous Hard ware	Screws	Q1, Q16, Q40
	Fasteners	Q1, Q16, Q40
	Wire	Q1, Q16, Q40

	Epoxy, Silicon Rubber, Adhesive, Conformal Coating	Q1, Q6, Q40
	Shelf life Materials	Q1, Q6, Q40
	Packaging Materials	Q1, Q40
	Gaskets	Q1, Q2, Q3, Q40
Test & Calibration	Test Equipment, New	Q1, Q14
	Test Equipment, Used	Q1, Q14
	Calibration	Q1, Q14

Note: If Suppliers have any Quality Issues or Questions (QIQ) regarding these Quality Codes, please email: **QIQ@Aethercomm.com**

Form#F-143 Rev AD (Last Updated 08/11/2021)

Quality Code Flow Downs for Purchase Orders

Q Attachment	Requirement	Detailed Requirement
Q1	General Quality Requirements	FOR USE ON ALL PURCHASE ORDERS Q1 applies to all proc
	Standard CofC (Certification of Conformance) & COO (Country Of Origin)	This statement must be included with shipment, signed and dated by this product meets all purchase order requirements, reference PN(s), and Country Of Origin.
	Records	Records of manufacturing, testing, processing, inspection, packaging minimum of 12 years. Records shall be made available for review on
	Counterfeit Parts Mitigation	The supplier and its' sub-tier suppliers shall ensure that only new ma to be delivered to Aethercomm. Electronic components shall be proc Franchised (licensed) Distributors. No electronic components shall b Franchised Distributors or Brokers without express written approval Quality Management. The Supplier shall include and flow down this materials, electronic parts, or assemblies.
	Competence, Training and Awareness	The supplier shall ensure personnel processing orders or performing product or service are trained and aware of the relevance and importa meeting the requirements of Aethercomm purchase orders and associ

Product Safety & Ethical Behavior	The supplier shall ensure personnel processing orders or performing product or service are aware of their contribution to product safety an behavior.
Right of Access	Right of access shall be given to Aethercomm, our customer and regu areas of all facilities, at any level of the supply chain, involved in the
Aethercomm/Customer Requirements Flow Down	Aethercomm will flow down Customer requirements to Suppliers wit Order. Aethercomm Suppliers shall flow down Aethercomm/Custom
Interactions with Aethercomm	All Supplier Interactions with Aethercomm should be initially coordi
Provide Test Specimens	When noted on the Purchase Order, Supplier shall provide test speci inspection/verification, investigation, or auditing.
Inspection & Test System	Inspection & Test System must be in place that ensures contract requ
Quality Program	Supplier must have a Quality Program Requirements system in place will be fulfilled
Non-conformance	A system shall be in effect for the control of material nonconforming purchase order requirements as per AS9100. If not certified to AS910 conforming material from conforming.
Shipping Insurance	Carrier shipping insurance is required for shipment of expensive part
Foreign Object Debris (FOD)	Supplier shall establish procedures to control and eliminate Foreign a manner to lower risk potential throughout the entire process. Proce Supplier shall be subject to review and audit by Aethercomm or their
Special Packaging	A specification or instruction will be called out in the Purchase Orde when required.
No-Clean Solder Paste Flux	The use of no-clean solder paste is prohibited. The use of no-clean fl removed. Should manufacturer’s recommendation state that residue of the specific flux is prohibited.
Electrostatic Discharge Protection	For the contractual requirements of parts that are ESD sensitive, Sup Sensitive Discharge (ESD) control program subject to review and ap request.
Approved Process Sources	Supplier shall use only Aethercomm approved sub-tier suppliers that awarded Purchase Order. A listing of Approved Suppliers will be pro A certification from the Supplier shall be forwarded with each shipm
GD&T	Unless otherwise specified, dimensioning and tolerancing shall be in 2009. Special attention should be given to section 1.4n which states “ tolerances apply for the full depth, length and width of the feature”.

	Review Q Codes	Review Quality Codes (at https://www.aethercomm.com/quality-clau Aethercomm RFQ (Requests For Quote), during Contract Review aft shipment to verify compliance with the latest requirements.
	Compliance Responsibility	FAI approval does not relieve the Supplier of the responsibility and/c all contract requirements.
	Vendor Chargeback	The purpose of Aethercomm's Vendor Chargeback requirement is to with Aethercomm's quality requirements. Aethercomm holds the Ve violations and financial penalties will be assessed for non-complianc with Aethercomm guidelines may be refused and returned at Vendor chargeback. Chargebacks may be issued for damage related to insuff quality concerns. Approved chargebacks will be deducted from a futu questions and concerns regarding chargebacks must be addressed wit Engineer.
Q2	Configuration Control	If the supplier makes any Class 1 (fit, form, or function) or Class 2 (other t notify the Aethercomm Quality Management in writing before the change changes require Aethercomm Quality Management approval. This include required to build the component being purchased.
Q3	First Article Required	**Suppliers of bare printed circuit boards** and fabricators of housings sha Report (FAIR) that records all inspection measurements and notes on SAE format (if equivalent to AS9102 contents). The FAIR shall reference the P accompany the FAIR item. Item undergoing FAIR shall be identified as F items/assemblies shall have been manufactured using the same production 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 fabricate required) The documentation shall include: • Drawing and Actual dimensions of the FAIR used to verify the part specifically stated on the PO) • Mill report/certifications for raw material, as required • Special Process certifications from sub tier suppliers • Heat Treat certifications, as required **Suppliers of housings, heat sinks or other fabricated metal parts and g** Inspection Report consisting of the Supplier's standard final inspection re drawing. **Suppliers of Cables** shall submit a First Article Inspection Report consisti inspection report and a ballooned Aethercomm drawing. **Contract Manufacturing for assembly of PCBs & AS9102 Certificatio** • The criteria to perform a FAIR is the same as detailed above. AS91 PCBs, not PCBAs • CM's awarded turn-key orders are required to flow down FAIR requ suppliers

Q4	Source Inspection	When listed on the PO, Source Inspection must take place before shipment typically for FAI. Or as imposed on Supplier by Aethercomm Quality Mar notification when required.
Q5	Deleted	Not used at this time.
Q6	Shelf Life	Product must be clearly identified with applicable manufacture & expiratio 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 obta waiver.
Q8	ISO 9001	Current Certification by an accredited 3rd party required when listed on th
Q9	AS9100	Current Certification by an accredited 3rd party required when listed on th
Q10	Nadcap	Nadcap accreditation -When required Special Process accreditation type w
Q11	Raw Material-Physical and Chemical Analysis	Include raw material certifications with shipment that includes a copy of th and chemical analysis Contract Manufacturing: Raw material certifications for fabricated parts (i.e. metal parts) shall be ke when requested
Q12	Clean, oil free	Products shall be clean and free from any residue including but not limited any type of foreign object debris.
Q13	Acceptance Test Report	Include with each shipment a true copy, signed by a responsible representa the lot or item acceptance tests required by the applicable specification. Th 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 ANSI/NCSL Z540 (most current revision) Certificates and Reports with tr • In the event of an Out-Of-Tolerance condition, the calibration supplier sh • The supplier shall maintain calibration records for a minimum of 12 year • Should repairs be done on a piece of calibrated equipment, the specific re calibration supplier. See purchase order for any additional information
Q15	Secondary Processes	Include the Aethercomm P.O. number on all documents relating to second etc.). Subcontract Assembly and Manufacturing companies – certifications for s 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 l bag/box must be identified. Parts must not be co-mingled with different pa

Q17	Packaging Bag & Tag-Individual	When material is sensitive to shipping or handling damage the entire lot m bag/box must be identified. Parts must not be co-mingled with different pa numbers. Parts must be individually wrapped/segregated to prevent contac All Silver-plated parts shall be packaged with anti-tarnish material such as Paper'.
Q18	IPC-6012 & IPC-A-600 (Latest Revisions)	Qualification and Performance Specification for Rigid Printed Boards & A Class of PCB = Class 3
Q19	IPC-6012 Space & IPC-A-600 (Latest Revisions)	Space and Military Avionics Applications Addendum to IPC-6012 & Acce of PCB = Class 3
Q20	Electrodeposited Copper Test Frequency: Monthly	When copper plating is specified, electrodeposited copper plating shall me a) When tested as specified in IPC-TM-650, Method 2.3.15, the purity of c b) When tested as specified in IPC-TM-650, Method 2.4.18.1, using 50-10 samples, the tensile strength shall be no less than 275.8 MPa [40,000 PSI] than 18%.
Q21	Prohibited Material	The following materials shall not be contained in any deliverable product e or material specification: • Pure, unalloyed cadmium or alloys containing 5 percent by weight or gre plated by a Buyer approved material. • Pure, unalloyed zinc or alloys containing 20 percent by weight or greater by a Buyer approved material. • Compound (e.g., plating, paint, other surface finishes) containing greater cadmium or zinc. Only applies to EEE components; excludes connectors, c mechanical or structural components. • Corrosive solder fluxes, unless detailed cleaning procedures are specified verification methods to insure removal of residual contaminant. • Pure tin, or >97 percent tin by weight, internally or externally. Tin-Lead alloyed with a minimum of 3 percent lead (Pb) by weight. Note that Sn96/ standard solder-attach materials used in high temperature soldering applica applications only. • Magnesium or selenium shall not be used unless inside a hermetically sea • Mercury, alloys of mercury, or compounds of mercury. • Materials exhibiting or known to exhibit natural radioactivity such as ura and/or any alloys thereof. • Materials exhibiting or known to exhibit health hazards such as unalloyec and/or any alloys thereof. • Gold plating over silver without a nickel barrier coating, silver under plat 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 whisk sublime in the intended application conditions and shall adhere to the print IPC-4552 Specification for Electroless Nickel/Immersion Gold (ENIG) Pla IPC-4553 Specification for Immersion Silver Plating for Printed Circuit Bo IPC-4554 Specification for Immersion Tin Plating for printed Circuit Boar

		IPC-4556 Specification for Electroless Nickel/Electroless Palladium/Imme Printed Circuit Boards. This requirement is applicable when driven by print note for a metal finish Follow the thickness requirements detailed in the applicable IPC specificat type of finish. All products shall be compliant to the IPC specification and conformance as a deliverable, as well as a XRF report to support the comp
Q23	Workmanship	Workmanship Classification for J-STD-001, J-STD-001S Space addendun and IPC/WHMA-A-620S Space addendum shall be Class 3.
Q24	Deleted	Not used at this time.
Q25	PCB Testing Labs	When IPC testing is required as detailed in these Aethercomm Quality Coc tests internally if they have existing facilities and qualified personnel. If Su 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 Quality Management. If a Supplier doesn't have a lab preference, Aetherco Testing Labs. Information can be found at http://preferredlabs.com/index.h 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 cable 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-MA (Middle Article) and LA (Last Article) that assures compliance to the 12 years and made available to Aethercomm upon request. Note: If during assembly Contract Manufacturers have difficulty meeting t may be utilized at Supplier's discretion to achieve the requirement.
Q28	Serialization	Products shall be serialized and barcoded on an ESD-safe label in a manne number characters shall be legible, scannable, and visually readable to the stated on the drawing, format of the barcode, serial number, and label size discretion. Serial number shall not exceed more than 40 characters. If utili similar, and should intended surface area be insufficient, the supplier shall the label . CCA/PCBA Manufacturers – Unless otherwise stated on the drawing, barc TOP side of the CCA/PCBA in such a way that does not interfere with the to comply, please contact Aethercomm for review.
Q29	Excess Solder	Excess solder present on the bottom side of the PCBA shall be wicked flat and/or function of the product. Suppliers may utilize 'Kapton Tape' on PC issues that arise from solder migration.
Q30	PCB Packaging	PCB Fabricators may utilize bulk/brick packaging methods with no more t PCBs, with Desiccant Packets included. Or individually bagged in bundles configuration of PCB, with Desiccant Packets included. All silver-plated parts shall be packaged with anti-tarnish material such as

		Paper’. Stiffeners Shall be utilized to protect array configurations, scored r potential for flexing or railed configured PCBs subject to breakage. Suppli 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 equal or better sensitivity and employ solvents with the ability to dissolve contaminants. An Ionic Contamination Cleanliness Report shall accompan retained for 12 years. Test results must be under IPC fail point of 10.06 ug
Q32	Surface Mount Electronic Component Placement	Surface mount electronic components including but not limited to SMD r be installed flat per J-STD-001 Class 3 requirements, unless otherwise ca
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 Q41-Batch or Q42-Single Piece Flow Lot Traceability as applicable. • Provide PCB Requirements as listed in Q35 when Turn-Key is specified
Q34	FBGA (Fine -Pitch Ball Grid Array)	FA (First Article), MA (Middle Article) and LA (Last Article) shall b validation. X-Ray evidence that assures compliance to the specificatio 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 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 620S • Any additional Contract specific requirements will be specified in Purch
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 bui • Assemblers and Inspector shall have valid IPC Space certification to IPC 620S • Any additional Contract specific requirements will be specified in Purch
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 inc • C of C (Certificate of Conformance) from all Aethercomm Supplier bui

		• Assemblers and Inspector shall have valid IPC Space certification to IP 620S • Photos required based on contract requirements provided by Aethercom Requirements: 1. High Resolution (24 megapixel photos, 6000 X 4000 image dimension 2. Within pictures include a metal ruler adjacent to the part for scale refer 3. Within pictures include an identification template with contract specifi 4. Photos of CCA/PCBA shall be of both sides. When conformal coat is r 5. Photos of Sub Assembly shall be all six sides. • Any additional Contract specific requirements will be specified in Purch
Q39	PCB Design Selection Characteristics	During design phase for PCB materials and their characteristics, Aetherco methodology. No Supplier modifications of print selected materials along constant (Dk) and dissipation factor (DF) attributes are allowed. Aetherco applications and any alterations are disastrous. If supply chain wishes to b manner to mimic the OEM attributes.
Q40	General Lot Traceability	The Supplier or their sub tiers shall provide documentation that maintains Manufacturer) traceability for materials/components used in the manufac At minimum, documentation shall include OEM name, part number, CoC COO (Country of Origin). With the exception of COTS: Commodities/Pa Catalog/Website such as Grainger, McMaster Carr, supplies from Home Non-Military/Space fasteners, Hardware shall only be traceable to the rev Aethercomm.
Q41	Batch Lot Traceability	The Supplier or their sub tiers are required to trace the lot/date code or se 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 Material) utilized during the assembly process, to the assembly work ord manufacturing build opportunity at CM/EMS – Contract Manufacturer o 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 se used on the assembly to the individual assembly serial number level. Allows Aethercomm to trace the lot/date code and serial number of each Material) utilized during the assembly process, to the individual assembl processes within the CM/EMS and sub-suppliers processing loop shall be unique identities of raw material inputs to that of the assembly serial num Q42 also includes the requirements of Q40 General Lot Traceability & Q