Ducommun Generic Quality Clauses

REQUIRED: The following Ducommun Generic Quality Clauses **"B"** shall be adhered on all Ducommun purchase orders and are applicable to all suppliers. Contact Ducommun sourcing representative for any exceptions or additional information regarding the following clause.

B1, *B9, B10, B14, B16, B17, B23, B25, B26, B29, B51, B63

***** Required when one of the bullet points have occurred.

B1) **Suppliers Quality System**: The supplier represents and warrants that it maintains a quality management system that complies with applicable industry standards; including but not limited to: ISO 9001, AS9100, AS9120, and/or AC7004. In the event Seller holds a third party certificate for its quality management system, Seller agrees to notify Buyer of any change in Seller's certification under such program within three (3) days of such change.

See Ducommun General Terms and Conditions of Purchase, section 10. Seller's Quality Program, for additional requirements.

B3) **Supplier's Calibration System**: If the supplier is a calibration service provider, it shall be in accordance with ISO 17025. If the supplier conducts calibrations on site, but is not a calibration service provider, the calibration system shall meet the requirements of ISO 10012. All calibrations shall be traceable to NIST or equivalent certification body.

B4) **Record Retention**: The supplier, and their subcontractors, shall maintain on file, at their facility, all inspection and test records for minimum of (10) years after delivery of the last item on this purchase order. These records shall be traceable to the articles delivered under this purchase order, and they shall be made available to authorized Government, regulatory agency and/or Ducommun representatives. The supplier shall maintain a records control system that ensures records remain legible, readily identifiable and retrievable. At the expiration of the retention period, Ducommun reserves the right to request delivery of such records. Records shall not be destroyed without Ducommun's written concurrence.

B7) **Special Process Documentation Requirements**: Special processes as used herein to include; heat treatment, welding, soldering, chemical films, environmental testing and plating. Certifications are to be submitted with the First Article Inspection (FAI) report only. After FAI approval and unless otherwise specified, the supplier shall maintain all applicable certifications for subsequent shipments at their facility for the specified record retention period. Certifications shall be maintained to allow retrieval and submittal to Ducommun Inc. within the requested time frame. The certification shall include;

A) Name of organization doing the process
B) The purchase order number.
C) Drawing number and revision.
D) Applicable process specification number and latest revision.
E) Quantity and serial numbers or lot numbers.
F) Authentication by an authorized representative of the supplier's quality organization.

B9) **First Article Inspection Requirement**: The supplier shall complete a new or updated (delta) First Article Inspection (FAI) for the following conditions:

- First time manufacture or first time distributing from a manufacturer to Ducommun Inc. (applies to Distributors/brokerage houses).
- A change in any manufacturing source, processing source, inspection method (including functional test requirements), location of manufacture, tooling, or materials.
- A change in the manufacturing process which may affect fit, form, function, or interchangeability of the product.
- A change in the plant of manufacture, including subcontractor changes.
- A change in design characteristics affecting fit, form, or function of the part.
- A change in numerical control program or translation to another media that can potentially affect fit, form, or function.
- A revision to the Engineering Drawing or Specification.
- Part has not been manufactured in two years.
- A natural or man-made event, which can adversely affect the manufacturing process.
- An implementation of corrective action required to complete a previous FAI.

A documented first article inspection report, per SAE AS9102, shall be provided with the first shipment. If any changes or lapses in the production occur, as defined per SAE AS9102, a complete or partial first article inspection report will be required. Include AS9102 First Article Inspection (Form 1, 2 and 3 with a balloon drawing) for all requirements and dimensions listed within the supplied drawing, including Modified Commercial off the Shelf (COTS) parts. Parts supplied to MIL, NAS, QPL, FED Spec, COTS or Catalog drawings numbers do not require AS9102 FAIR, but a Certificate of Conformance including expiration date of age sensitive elastomers and O-Rings is required.

Conditional Requirements: Form 2 Customer Approval Verification shall be filled out with “Yes” or “No”. Special process(es) or material sources are approved by the Bill of Materials or customer. Enter “Yes” if approved: “No” if approval is required, but process or source is not approved. Form 3 Nonconformance Number must include a document reference number if characteristic does not conform or is approved via any method not listed by Requirement.

B10) **Limited Shelf Life Requirements**: All items with limited shelf life shall be clearly marked with the manufactures name, type of material, shelf life, expiration date, and date of manufacture (must have a least 80% shelf life remaining). If a hazardous material, supplier shall include Safety Data Sheets with the first shipment of such materials.

B13) **Physical and Chemical Analysis**: Submit with each shipment a test report of the actual physical and chemical material analysis and a certificate of conformance to the applicable material specification(s). The certificate shall contain a list of the applicable specification(s), including revision levels and traceability by heat lot or melt numbers. The test report analysis shall list the range of values within the properties of the material used to fill this order.

Test Report must also contain:

1. Name and location of material manufacturer.

2. Material identification by specification number and material condition.
3. Manufacturer or mill identification number of raw material.

B14) **Certificate of Conformance**: A certificate of conformance (CofC) shall be included for all material or items shipped on this purchase order. The supplier shall certify that all material, or items listed, conform to all applicable drawings, specifications, standards, and purchase order requirements. The CofC shall include:

- Supplier's name/address of facility that manufactured the material or performed the process or test.
- Ducommun's purchase order number
- Part number(s) with revision when available.
- Quantity and Date Shipped
- Unique Traceability Number such as; the identification of the Manufacturer and Manufacturer's Production Lot Number / Wafer Run / Wafer Number / Plating Batch Number, sales order or work order number or other manufacturer's traceability identification (as applicable) clearly identified as such within the CofC.
- If applicable, shelf life requirements by one of the following: expiration date, recommended use date, and/or the production date with the manufacturer's recommended shelf life.
- Statement certifying that the material(s) covered by the certification are in compliance.
- Signature of an authorized company representative of the supplier certifying the material.

If the seller is other than the original manufacturer, an original manufacturer's Certificate of Conformance / Traceability or Certificate of Origin is preferred; an Authorized Manufacturer Distributor's Certificate of Conformance is acceptable.

B15) **Test Data**: Copies of all test data must be submitted with the items on this purchase order. Test data must be traceable to the item tested, by either serial number or other permanent marking on the tested assembly.

B16) ESD Package's: Devices on this order shall be packaged in containers capable of protection from damage by electrostatic discharge (ESD) in accordance with MIL-S-19491 or MIL-M-55564. Packages shall be marked externally; "Caution- Contents subject to damage by electrostatic discharge," or with sensitive electronic device caution label per MIL-STD-129. For such devices, material shall be manufactured, stored, handled and shipped in accordance with the electrostatic discharge control requirements of MIL-STD-1686, ANSI/ESD S20.20 or JEDEC Standard JESD625. Take necessary precautions to ensure static sensitive items or repair services to static sensitive items are protected from electrostatic discharges.

B17) **Right of Entry**: Ducommun, Ducommun's customer or customer representative, and regulatory authorities have the right of access to applicable areas of the facilities and documented information of the processes, products, and services provided.

B23) **Procurement & Manufacturing Source Controls**: The supplier shall comply

with the following requirements. Exception: If you are a franchised distributor section II, is not applicable.

I. PROCUREMENT CONTROLS

A. Supplier must:

1. Maintain an approved and/or qualified manufacturers list or for source(s) listed on the purchase order,
2. Have available and use the Government Qualified Products List (QPL) and the Government Qualified Manufacturers List (QML).
3. Procure all Military specification parts from QPL sources.
4. Define and stipulate in Supplier's purchase order to the third parties, all applicable Ducommun and/or Military specifications and related requirements.

B. Distributor's certifies that:

1. For items still in production, materials and/or parts furnished to Ducommun are from a manufacturer for whom the Distributor is an authorized and/or Franchised Distributor.
2. For obsolete (Out of Production) items, materials and/or parts furnished to Ducommun are from sources that (1) were approved at the time of item manufacture (drawing-based items), and (2) can validate the authenticity of the item, based on part number and/or manufacturer's identification marking (MIL spec. items). Otherwise, the Distributor shall notify the Ducommun Buyer prior to acceptance of the Purchase Order, so a decision can be made on the purchase.

II. MANUFACTURING SOURCE CONTROLS

A. Supplier's and Distributor's must have a quality system which:

1. Requires the manufacturer to submit inspection/test data for material purchased when required by the purchase order. NOTE: If the item is obsolete (Out of Production) and test data is not available, the Supplier and/or Distributor shall notify the Ducommun Buyer, prior to acceptance of the Purchase Order, so a decision can be made on the purchase.
2. Requires material certifications to be maintained on file or furnished to Ducommun, if requested.
3. Maintains files containing physical and electrical test reports, that verify conformance with applicable specification requirements, are on file in accordance with II.A.1. and II.A.2. All such data shall be maintained for a period of not less than 7 years from completion of all deliveries and made available to inspection by, or copies supplied to Ducommun upon request.
4. Determines the adequacy and qualifications of the manufacturers represented.

B. Supplier's and/or Distributor's that perform or sub-contract Value-Added assembly, processes, fabrication or product-altering operations of any kind, shall have written authorization from the Original Equipment Manufacturer (OEM) and Ducommun on file.

B25) **DATE/LOT CODE SHIPPING REQUIREMENTS**

Each shipment shall consist of material from only one manufacturer and a single date coded or numbered lot, and must be indicated on all delivered paperwork (i.e. pack list and Certification of Conformance). Where impractical to stamp individual parts due to size or shape, the lot or batch number will be stamped on identifying tags or the smallest unit package.

If Lot/Date Codes are not available due to use by the Manufacturer of unique serial numbers in lieu of Lot/Date Codes, the serial numbers shall be noted on shipping documents.

If this requirement cannot be complied with:

1. Seller shall notify the Buyer of the minimum number of date coded lots per shipment, and the minimum number of parts per lot that Seller can ship on a best effort basis.

2. With Buyer concurrence, multiple manufacturer and date coded lots may be included in one shipment provided that they are segregated, packaged and identified separately.

OR

The buyer may issue unique Purchase order line numbers to clearly distinguish between different Lot/Date Codes. Supplier may request this option to address any concerns.

Each different Manufacturer and date coded lot must be documented as a separate line number on the Shipper and Certificate of Conformance, and the shipper must document the following minimum information:

Manufacturer Name

Lot/Date Code (or serial number as above if applicable)

Manufacturer P/N

Country of Origin

Quantity

B26) **Change Control**

Seller agrees to maintain strict controls to assure that, after the item(s) successfully pass the qualification, no changes will be made to any design, material, part, process, procedure, tooling or test equipment; nor shall they be altered, redesigned or replaced by any other design, material, part, process, procedure, tooling or test equipment, without prior written approval of the Buyer.

In addition, the items shall not be produced at a facility other than the Seller's original facility which produced the acceptable items, without prior written approval of the Buyer.

The Buyer requires the Supplier’s written notification prior to implementation of changes to the design, source(s), materials, processes, testing, or acceptance criteria, or location of manufacture that affects or can potentially affect form, fit, function, or reliability. If required by the source control drawing, the supplier shall not ship changed product unless notified in writing of change acceptance by the Buyer.

The definition of change does not include the following: editorial or administrative changes such as spelling or typographical errors, clarifications, personnel, maintenance, or equipment changes not affecting the qualified product.

Upon receipt of such notice from the Seller, the Buyer shall have the right to direct the Seller to repeat all or part of the qualification at Seller's expense and to obtain from the Seller all data necessary to prove the acceptability of the proposed change. The Buyer shall provide all

data to Customer for concurrence and/or Approval as directed by contractual flow down. Buyer shall not provide approval to Seller until approval is received from the Customer, as required.

Notwithstanding the above provisions, Seller agrees that the items to be supplied hereunder will conform to all applicable procurement specifications and drawings, as amended.

B29) **COUNTERFEIT PARTS PREVENTION**

The supplier shall have processes and controls to ensure no Counterfeit Material is delivered to Ducommun or Ducommun assigned customers. Supplier shall have a process that is compliant to AS5553 as a whole, and specifically have processes in place to support all of the requirements of section 4. Requirements; from 4.1 Counterfeit Electronics Parts Control Plan through 4.1.6 Material Control. Supplier shall maintain documentation, i.e. Certificates of Manufacture, Certificates of Conformance, Independent 3rd party testing, and other documentation necessary to assure traceability to Original Equipment Manufacturer. Documentation, including traceability to the OEM, shall be maintained per record retention requirement flow down, and be available upon demand.

Suppliers are expected to flow down this requirement to all suppliers back to the original manufacturer. If a counterfeit part issue occurs, Ducommun requires the sources of the supplied counterfeit parts be provided.

Suppliers are required to assure full compliance thru audits, 3rd party audits, random compliance testing, etc.

See Ducommun General Terms and Conditions of Purchase, section 13. Counterfeit Parts Prevention, for additional requirements.

B48) PWB FAB DATA

-Certificate of Conformance (required with every shipment)
-Solder Sample (required with every shipment of a new date code)
-Test Certificate (required with every shipment)
-Micro-section (required with every shipment of a new date code)
-Micro-section Report (required with every shipment of a new date code)
-Material Certificates (required with every shipment)
-AS9102 FAI or Delta FAI (required with first shipment, revision change, or lapse of manufacturing for more than two years)
-Ionic Cleanliness Test (required with every shipment)

B50) REQUIREMENTS FOR CABLE & WIRE HARNESS ASSEMBLIES

Supplier shall ensure that all cable and wire harness assemblies comply with IPC/WHMA-A-620 (Requirements and Acceptance for Cable and Wire Harness Assemblies), and that all operators and inspectors are certified to that standard. All cable and wire harness acceptance tests shall be performed using the appropriate mating connectors or pins. No probing of pins with non-mating connectors is allowed.

All mechanical crimp connections shall be verified as satisfactory by a crimp pull test, industry-accepted "go/no go" gauging of crimp tool, or crimp barrel measurements. Crimp pull tests shall be conducted on crimp samples only, and not be performed on

deliverable hardware.

B51) FOREIGN OBJECT DEBRIS ("FOD") / FOREIGN OBJECT ELIMINATION ("FOE") PROGRAM

Supplier shall maintain a documented FOD/FOE program that complies with AS9146. It shall include, at a minimum, the following elements: FOD Awareness / Training, Parts Protection / Material Handling, General Housekeeping (5S or 6S), and FOD Reporting and Investigation. Supplier shall provide FOD/FOE program documentation and training records to Ducommun to review upon request. Supplier may reference the (1) National Aerospace FOD Prevention, Inc. ("NAFPI"), Standard NAS 412, and (2) International Aerospace Quality Group ("IAQG") – Supply Chain management Handbook section 7.3 as guidelines.

B52) ENVIRONMENTAL PRODUCT REQUIREMENTS

Supplier shall comply with all environmental product requirements set forth in the PO, drawings or specifications. Supplier shall comply with requirements for (a) ROHS Directive 2015/863 ("RoHS 3"), (b) REACH Regulation 1907/2006 ("REACH"), (c) WEEE Directive 2012/19/EU, (d) Packaging Directive 94/62/EC, (e) US TIPPA packaging requirements, (f) Battery Directive 2006/66/EC, (g) California Proposition 65, and (h) other prohibited or restricted substances. Any required regulatory markings or notifications shall meet the corresponding regulatory agency requirements.

Supplier shall ensure that its manufacturing processes do not add any non-compliant RoHS or REACH substances to the delivered products.

B54) Parylene Coating

Coating meets the performance and workmanship requirements of IPC-CC-830B, J-STD-001, and IPC-A-610.

B55) Pure Tin Finish Prohibited

1. Tin alloy component lead finishes or as an undercoat containing lead (Pb) shall contain no less than 3% Pb. Components with tin alloys other than Pb (e.g. SAC finish) require the Tin (Sn) content be less than or equal to 97% and require the seller to notify Ducommun of the alloy, which may require refinishing with a Tin/Lead (Sn/Pb) alloy prior to delivery. After supplier notification to the Ducommun buyer, the supplier shall expect written direction from Ducommun.
2. Use of components in assemblies/products with pure tin termination or lead finish is prohibited (applies to all internal and/or external components).
3. All components with solderable terminations shall have the termination finish verified by X-Ray Fluorescence (XRF) or other suitable measurement to confirm a minimum 3% Pb content. XRF measurements shall be accomplished on a 3 piece minimum sample of each component lot upon receipt. Should component part numbers identified on the assembly Bill of Materials (BOM) reflect pure tin only components or the component manufacturer no longer offers Sn/Pb finishes, the manufacturer shall offer alternate component part numbers whenever possible, or a pure tin mitigation plan to Ducommun for approval.

B60) Solderability

Product shall be solderable and capable of successfully passing solderability testing,

including “steam aging”, in accordance with any of the following: Military qualified components qualified to a military specification or standard, the applicable test method for solderability as follows will apply: MIL-STD-202, Method 208; MIL-STD-883, Method 2003; MIL-STD-750, Method 2026; or IPC / EIA J-STD-002, Category 3 when solderable finish terminations or leads are specified. Commercial or industrial grade components shall be solderable and capable of successfully passing solderability testing, including steam aging in accordance with IPC / EIA-J-STD-002, Category 2 requirements.

B63) Traceability and Serialization
Material supplied shall be identified by a unique identification and traceable to the original manufacturer by lot number, material type specification and applicable change number, heat number, etc. If parts are serialized, the supplier shall provide a list of the serial numbers with each shipment (either on the packing slip or on an attached separate sheet). All manufacturing, purchasing and traceability records are to be retained for a minimum of seven (7) years and shall be made available upon request by the Ducommun buyer.

B67) Solder processing and requirements shall be in compliance with ANSI / IPC J-STD 001, Class 3. Solder Workmanship shall be in compliance with IPC-A-610, Class 3.

B68) Positive etchback is a required (applicable to multilayer FR4 / Polymide PWBs). All vias shall be flush with conductor patterns on external layers / Minimum via wrap requirement shall be maintained. Cross Section samples and measurement data correlated to the sample location measured or copies (photos) and measurement data of samples per the applicable IPC/Military specification, as specified on the drawing, shall be provided by the manufacturer with the deliverable product. The sample SHALL be in accordance with the applicable IPC / Military specification and as a minimum representative of the minimum and maximum diameter BLIND, Micro and THRU vias contained within the subject PWB and clearly exhibit etchback and via characteristics. It is highly suggested that the micro section sample(s) be taken from an actual PWB from each panel rather than from the standard IPC/Military panel coupon.

B69) Per DFARS 252.204-7012 Safeguarding Covered Defense Information and Cyber Incident Reporting, comply with NIST SP800-171 for provided CUI marked drawings, prints, specifications, etc.

Customer Flow-Down Quality Clauses

BC22) KEY PERFORMANCE CHARACTERISTIC (“KPC”) (Viasat QAPP 52)
Software: The supplier shall provide software and programmable logic that meets all KPCs identified by the customer.
Hardware: The customer will identify KPCs on the drawing or specification with an ST (Statistical Tolerance) designation. When a KPC is identified, Supplier shall obtain measurement data (on all units for lot sizes < 30 and on at least a 30 unit random sample for all larger lot sizes) and calculate the CpK for such measurement data. Supplier shall only ship a lot when the CpK for

each KPC in a lot is greater than or equal to 1.33. If the CpK for any KPC is less than 1.33, Supplier shall not ship the lot and shall notify a Ducommun representative and request a formal deviation. Supplier shall record all measurement data using the format set forth in PR000665 (CPK Calculating Worksheet). Prior to shipment, Supplier shall (1) email the data for each lot to viasattestdata@viasat.com or (2) upload the data to a Viasat-provided ftp site, and notify the Viasat Quality representative. The subject line for each email submission shall be “Cpk data for P/N XXX, Viasat PO Number YYY, and PO Line item number ZZZ.”

BC23) WORKMANSHIP STANDARD (Viasat QAPP 8)

Supplier shall ensure that materials and workmanship conform to the following requirements:

(a) IPC-A-610, Class 3 (for all electrical and electronic assemblies and for PWAs reworked per IPC-7711/7721);
(b) IPC-A-600 Class 3 (for PWBs);
(c) IPC/WHMA-A-620 Class 2 (for cable and wire harness assemblies);
(d) IPC-7711/7721 (for rework, repair and modification of electronic assemblies and PWAs);
(e) the current version of ANSI/ESD S20.20, MIL-STD-1686 or MIL-PRF-81705 (for electrostatic discharge sensitive material); and the Viasat Standard for Workmanship and General Practices (070-QA-044) (for mechanical workmanship of metal assemblies)

BC24) Printed Circuit Board Requirements (CAES Quality Code QA39)
Manufacturers of Printed Circuit Boards:

a. Manufacturers of Printed Circuit Boards (Supplier) shall perform structural integrity tests IAW the drawing and the SOW. In the absence of guidance from the SOW and/or drawing, manufacturer shall comply with IPC-6012, Class 3.
b. If Supplier's lab is IPC-QL-653 and/or ISO 17025 CERTIFIED, testing may be performed by the Supplier's lab, but Buyer's approval in writing is required in advance. Otherwise, third party testing shall be performed at Robisan Laboratory Inc, Indianapolis, IN 46219. Testing charges for compliant coupons shall be charged to CAES by Robisan. All charges associated with non-compliant coupons shall be borne by the PCB manufacturer, and payment arrangements must be made with Robisan in advance.
c. All coupons shall comply with IPC 2221 standards. Coupons shall be sent to Robisan mounted for cross-section, but the nomenclature for the panel must be clearly marked. Nomenclature includes: Panel #, Panel Lot #, Part Number of PCB and UL, UR, LL, or LR corner indicator.
WARNING: Buyer reserves the right to disassemble a puck, or to require a PCB manufacturer to supply unmounted coupons to Robisan at any time, in which case all of the aforementioned nomenclature must be clearly visible on each coupon **and shall be etched in copper.**
d. Buyer may invoke D coupon testing at any time, and PCB manufacturer will receive a timely notification. "D" coupons shall be manufactured and delivered to Buyer with every panel, even when "D" coupon testing is not invoked. Lab test reports must be traceable to PCB panel and individual PCB serial number. D coupons shall always be supplied unmounted, and shall contain the following nomenclature etched in copper: Panel #, Panel Lot # and Part Number of PCB.
e. Supplier shall submit test results and coupons from (a) and (d) to Buyer via email and wait for Buyer's approval to ship the associated products. Supplier shall not ship hardware to Buyer without Buyer's written permission for each lot.
Requirement II: Requirements for CCA Contract Manufacturers (CCACM) purchasing Printed Circuit Boards on behalf of CAES:

a. CCA Contract Manufacturer (CCACM) shall flow-down Requirement I verbatim, to its PCB suppliers. CCACM shall ensure that all costs associated with testing were properly identified and quoted by the PCB supplier.
b. CCACM shall place PCB supplier on SHIPMENT HOLD for every PCB lot, pending written approval of structural integrity test results from CAES Supplier Quality (email reports to). CCACM is responsible for receiving approval from CAES. SAN3-Quality-Supplier- Quality-Enqineerinq@caes.com
c. All test results must be traceable to PCB panel and individual PCB serial number. CAES Supplier Quality Engineering shall complete and send an approved CSI form (902152-2) along with the attached Requirement I (a) Lab test reports to the CCACM for any passing Lab test reports. When approval in writing has been received, CCACM shall allow PCB vendor to ship boards to CCACM.
d. CCACM shall store the reports and coupons, including untested "D" coupons, for the retention period required by the Purchase Order Contract with CAES. If the CAES Purchase Order Contract has no requirement, CCACM shall store records for 5 years. Coupons shall be considered records for purposes of retention.

Requirement III: Requirements for CAES Quality Control

All shipments of PCBs and Circuit Card Assemblies (CCAs) shall be reviewed to ensure approved CSI form from Robisan testing is included. Lab test reports must be traceable to PCB panel and serial number. Reference WI000906-01_07.

BC25) Coupon Testing and Test Reports (CAES Quality Code QA39B)

Coupon/sample evaluation test report showing compliance to IPC-6018 and drawing requirements shall be provided with every delivery of printed circuit boards (PCBs). For PCBs with any vias: PCB coupons/samples shall be sent for evaluation services IAW IPC-6018 to a Buyer-approved independent lab that is certified to IPC-QL-653 or ISO 17025. For double-sided PCBs with no vias: PCB coupons or samples may be tested IAW IPC-6018 at the manufacturer's lab if the lab is certified to IPC-QL-653, ISO 17025 or is found to be acceptable by Buyer. When no lab certifications exist, Buyer's dated, written statement of lab acceptability must be included in every report. Buyer's written statement of lab acceptability shall expire one (1) year after issuance.

BC26) Micro-Section Coupon (Raytheon Q-Note TH)

1. The most current revision and Class 3 requirements in IPC-6011 shall be used.

Seller to Deliver the following to Raytheon for Raytheon Approval

2. If the printed circuit board micro-section fails external annular ring, each PWB delivered shall be visually confirmed to be compliant to the registration requirement.
3. The seller shall not deliver against this purchase order until approval from Raytheon has been received.
4. The seller shall provide, for Raytheon approval, representative micro-sections and coupon strips used for product acceptance for each Type 3, 4, 5, and 6 PWBs per IPC-6012 and Types 3, 4 and 5 flexible PWBs per IPC-6013 and Types 3, 4, 5, 6 and 8 high frequency (microwave) PWBs per IPC-6018. IPC micro-sections and coupon strips for each panel shall be determined as follows:

4.1. If "A" and "B" micro-sections are submitted, the following are required:

4.1.1. One "A" micro-section that has not been thermally stressed (as received). Sectioned

in either “X” or “Y” direction.

4.1.2. One “A” micro-section that has been thermally stressed. To be taken from opposite corner and sectioned in opposite direction (“X” or “Y”) of the unstressed specimen mentioned above.

4.1.3. “B” micro-sections that have been thermally stressed (micro-sections in both the "X" and "Y" direction are required).

4.2. If “A/B” micro-sections are submitted, the following are required:

4.2.1. “A/B” micro-sections that have not been thermally stressed (as received).

4.2.2. “A/B” micro-sections from opposite corners of the panel (one in the “X” and one in the “Y” direction) that have been thermally stressed.

4.3. If the board contains blind, buried, or micro vias, the following is required:

4.3.1. One thermally stressed micro-section representing each unique via shall be submitted.

4.4. For all submitted micro-sections, the following shall also be provided:

4.4.1. Coupon strips representing any micro-sections required in paragraphs 4.1, 4.2, or 4.3 (as applicable).

4.4.2. Any special coupon strips (impedance, peel strength, wire bond, etc.) that are specified on the master drawing. The coupon strips and micro-sections listed above will not be returned to the supplier.

5. The seller shall provide a document package along with the Micro-sections and Coupon Strips shipment. The documentation package shall contain at a minimum:

- Certificate of Conformance stating conformance to the specifications
- A list of the panel numbers and corresponding boards shipped. Also, indicate which panels were scrapped during fabrication.
- A list of the panel numbers for which micro-sections were submitted. Microsections must be marked to indicate panel number.
- Electrical test results to include impedance data when required by the PWB drawing.
- Statement of results of "R" coupon testing by panel number if used to verify acceptable internal layer registration. Use of a "modified F" coupon is acceptable in some cases if it is used for the same purpose as the "R" coupon.

6. The seller shall provide all required micro-sections and coupon strips to an approved Raytheon test labs listed in the Quality Note ***“Supplier Listing”***. The list of Raytheon approved test labs is located on the Raytheon Quality Notes website (http://qnotes.raytheon.com).

Address for FA Lab McKinney TX
Raytheon Technologies
2501 West University
McKinney, TX 75071

Failure Analysis Lab
Mail Station 8011

Address for FA Lab Largo, FL
Raytheon Technologies
8058 114Th Ave,
Largo Fl 33773

7. The seller shall receive approval from the Raytheon approved test labs. Approval will be provided using the supporting document ***"Approval Form"*** located on the Raytheon Quality Notes website (http://qnotes.raytheon.com) adjacent to the quality note.
8. The seller shall include a copy of the Raytheon approved approval form with each shipment of material to Raytheon.
9. The seller shall retain a set of micro-sections and/or coupon strips to represent the product delivered if multiple sets are available at the time of shipment. The seller shall also retain other acceptance micro-sections and additional coupon strips that are part of the fabrication panel. However, if only one set of coupons is available, that set shall be delivered to Raytheon for data retention.
10. Seller shall provide a PWB (may be non-functional) from each lot with shipment. Samples from each final finish process batch are required if more than one finish batch is contained in a lot. Part shall be marked as a "Solder Sample" and provided as part of the documentation package. An exception to this requirement may be made for high value parts or for lots with 100% yield or if a surplus board is not otherwise available. This exception must be authorized in writing by the buyer prior to shipment.

Seller to deliver the following to Raytheon for Raytheon Approval.

- Micro-sections, coupon strips and documentation package as specified in requirement 4, 5, and 6. A copy of the Raytheon approved approval form as specified in requirement 7.

Revisions

Rev.	Description	Date
A	Original release of F-00010 as the Ducommun Corporate document 38-4000 Rev Q without changes.	**09/19/12**
B	Updated to Rev Q of Corporate Document including Added clause BC19, SPOC 003.	**02/11/13**
C	Removed Reference to 38-4000, Added BC20.	**05/05/15**
D	Removed hyperlink in clause BC20.	**03/10/17**
E	Added BC21, BC22, BC23, B48, B49, B50, B51, B52.	**07/24/17**
F	Added B53, B54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, and changed B17 to include regulatory authorities.	**04/23/18**
G	Modified B54 to include IPC-A-610 and added B64, 65, 66, 67, 68, and 69.	**05/02/18**
H	Modified B64.	**06/25/18**
I	Modified B1.	**05/15/19**
J	♦ Add Proprietary Information statement.♦ Added Generic Quality Clause requirements for all suppliers.♦ Deleted all unused codes. (B2, B5, B6, B8, B11, B12, B18-B22, B24, B27, B28, B30-B47, B49, B53, B56-B59, B61, B62, B64-B66, BC1-BC18) Will not be listed below unless otherwise noted.♦ B1 - Added "See Ducommun General Terms and Conditions of Purchase, section 10. Seller's Quality Program, for additional requirements."♦ B1 - Combined B23 into B1. Breaking out B23. Removed sections about ESD into B16 and FOD into B51.♦ B3 - Combined B3.1 into B3. B3 is not currently used.♦ B7 - Added "Certifications are to be submitted with the First Article Inspection (FAI) report only. After FAI approval and unless otherwise specified, the supplier shall maintain all applicable certifications for subsequent shipments at their facility for the specified record retention period."♦ B9 - Added the changes needed for a Delta or FAI.♦ B10 - Changed title. Combined B53 with it.♦ B11 - Combined B11 into B26.♦ B13 - Combined B13.1 into B13.♦ B14 - Combined B58, B14.1, B14.2, and B14.3 into B14. Add more detailed requirements.♦ B16 - Added last 2 sentences from B23 associated with ESD.♦ B21 - Combine B21 into B55.♦ B23 - Removed ESD reference, part of B16. Removed FOD reference, part of B51. Removed receiving controls, part of B63. Removed stock room controls, part of B1. Required for QMS certifications. Removed NC and CAPA that pertain to requirements of a QMS, which is a requirement of B1. Added an exception about Franchised distributors in section II.♦ B25.1 - Combined B25.1 into B63.♦ B25.2 - Combined B25.2 into B25. First sentence.♦ B26 - Added 3rd paragraph.♦ B29 - Added, "See Ducommun General Terms and Conditions of Purchase, section 13. Counterfeit Parts Prevention, for additional requirements."♦ B47 - Combined B47 into B3.♦ B51 - Added FOD program comply with AS9146. This is a customer requirement.♦ B52 - Removed reference	**04/17/20**

	to Viasat document PR000608 to generalize it for all vendors. Updated RoHS3 for 2015-863.♦ B53 - Combined B53 into B10.♦ B55 - Updated to include customer requirements.♦ B56 - Deleted B56, not required as a flow down by the customer. It is part of B23.♦ B59 - Deleted B59, not required as a flow down by the customer. It is part of B14.♦ B61 - Deleted B61, not required as a flow down by the customer.♦ B62 - Deleted B62. Now in DCO T&C's (29).♦ B63 - Added more detail for traceability & serialization to meet all customer's requirements.♦ B64 - Deleted B64. Now in DCO T&C's (19).♦B65, B66, B69 – Deleted, not required as a flow down by the customer.♦ BC's - Deleted BC codes associated with customer flow-downs to reduce confusion.	
K	Add to B9 clause to include Conditional Requirements.	**07/22/21**
L	Added BC24 to address a new customer requirement.	**08/31/22**
M	Added: (1) including traceability to the OEM (2) If a counterfeit part issue occurs, Ducommun requires the sources of the supplied counterfeit parts be provided.	**05/25/23**
N	Clarified *B9 requirement on page 1. Updated B9 to include 2 additional FAI requirements to align with AS9102. Added BC25 and BC26 to address additional customer requirements for test reports and coupon testing. Added customer name and specific flow down next to each BC code.	**12/21/23**
O	Updated BC24 per CAES 902152**AL**01 update for Q39.	**02/24/24**
P	Added B69 for NIST SP800-171 compliance.	**09/24/24**