Quality Assurance Procurement Provisions – QAPPs

RULE: All future changes (ECOs) for this document must be notified to Supplier Management Process Owners (CQ QA & QC Manager & SCG Business Process Manager, or equivalent). These related documents – PR000539, & PR001196 – must be reviewed and modified in the same ECO if commodity codes are changed.

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Quality Assurance Procurement Provisions – QAPPs

QAPP	Class	DESCRIPTION	DELIVERABLE
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63 B	I	CE OR CB SAFETY REPORT FOR EUROPEAN AND UK COMPLIANCE	Provide complete third party CE or CB safety report
63 C	I	EMC TEST REPORT	Provide EMC test report showing compliance with EMI and EMC requirements.
63 D	I	NRTL CERTIFCATE OF COMPLIANCE FOR NORTH AMERICA	Provide Nationally Recognized Test Laboratory (NRTL) certificate of compliance or yellow card
64	I	FCC ID AND ISED NUMBER FOR INTENTIONAL RADIATOR EQUIPMENT	Provide FCC and/or ISED ID number for intentional radiator equipment.

Postfix after each QAPP represents the classification: A: Auditable (Processor or System), I: Inspectable (Product or required Documentation), UA: Unique/exception, and Auditable, UI: Unique/exception, and Inspectable.

The following provisions, based on the versions in effect at the time a purchase order ("PO") is placed, form an integral part of the PO and are incorporated by reference on the PO to the extent specified therein. These provisions do not apply to Commercial off the shelf ("COTS") parts. The QAPPs will be assigned by the responsible PQE if they are not on the PO.

X. (A) OVERVIEW OF Ts & Cs

As called out in the Ts & Cs PR001076 (revision 25 or later), Supplier shall:

1. Follow the order of precedence (17b)
2. Conform to drawing and specifications (2)
3. Package all goods to assure safe arrival at the destination (4e)
4. Maintain inspection and process control system acceptable to Viasat (7a)
5. Allow right of entry and/or allow for surveillance/inspection activities by Viasat or Viasat customer at Supplier facility (7b)
6. Calibrate, maintain and care for any Viasat furnished tooling and equipment (8)
7. Warrant all goods delivered for the defined period (10)
8. Report nonconforming material to be submitted to Viasat prior to shipment (17m)
9. Maintain a Counterfeit Electronic Parts Prevention and Control Plan (17t)

5. (I) CERTIFICATE OF COMPLIANCE ("C of C")

C of C is required with each shipment. The C of C shall contain the part number(s) ("P/N(s)") listed on PO, the name of an authorized quality assurance ("QA") representative, and will read substantially as follows: "Materials and processes, including special processes, used to produce the item(s), components and parts described on the PO conform to all PO requirements, referenced specifications and special requirements." If applicable, it shall include serial number(s) ("S/N(s)"), lot codes and date codes. If source inspection per Quality Assurance Procurement Provision ("QAPP") 15 or 15.A is invoked on this order, the source inspector shall review the C of C and indicate acceptance on the certificate (stamp or signature). If the C of C is being provided by a distributor and the units are bought to an AML, the C of C must additionally reference the original manufacturer's name and the manufacturer's part number.

For submission information see Supplier Submission and Communication Matrix[see ref 1]

7. (UI) GOVERNMENT SOURCE INSPECTION

Government source inspection is required prior to shipment. Upon receipt of this order, Supplier shall (1) promptly furnish a copy of this order to the Government quality assurance representative who normally services Supplier's plant (or, if none, to the nearest Army, Navy, Air Force or Defense Supply Agency Inspection office) and (2) schedule the required inspection. In the event the representative or office referenced in (1) cannot be located, Supplier shall immediately notify the applicable Viasat Supply Chain representative. Supplier shall notify Viasat at least 48 hours in advance of the scheduled time of Government inspection so that Viasat can, at its option, arrange for concurrent witness.

8. (I) WORKMANSHIP STANDARD

Unless specified otherwise on the applicable drawings or specifications, Supplier shall ensure that materials and workmanship conform to the following requirements:

(a) IPC-A-610, Class 2 (for all electrical and electronic assemblies and for PWAs reworked per IPC-7711/7721);
(b) IPC-A-600 Class 2 (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
(f) the Viasat Standard for Workmanship and General Practices (070-QA-044) (for mechanical workmanship of metal assemblies).
(g) IPC/JEDEC-J-STD-033 Handing, Packing, Shipping, and Use of Moisture, Reflow, and Process for Sensitive Devices

8A. (I) WORKMANSHIP STANDARD - FOR SPACE PROGRAMS

Unless specified otherwise on the applicable drawings or specifications, Supplier shall ensure that materials, workmanship, cleanliness, testing and packaging conform to the following requirements:

(a) IPC J-STD-001 with Space Addendum (for all electrical and electronic assemblies and for PWAs reworked per IPC-7711/7721);
(b) IPC-A-600 Class 3 (for PWBs) with cross-section analysis to follow the associated drawing requirement of either IPC-6012 with space addendum, IPC-6018 with space addendum or IPC-6013 class 3;
(c) IPC/WHMA-A-620 with Space Addendum (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, MIL-PRF-81705 or IEC/EN 61000-4-2 (for electrostatic discharge sensitive material); and
(f) the Viasat Standard for Workmanship and General Practices (070-QA-044) (for mechanical workmanship of metal assemblies).
(g) IPC/JEDEC-J-STD-033 Handing, Packing, Shipping, and Use of Moisture, Reflow, and Process for Sensitive Devices

10. (UI) RAW MATERIAL REPORTS

With shipment, Supplier shall forward reports of mechanical properties and chemical compositions to show evidence of conformance to all applicable specifications for all raw material used in fabrication. With shipment of chemical orders, supplier shall forward a safety data sheet ("SDS").

11. (UI) TRACEABILITY OF RAW MATERIAL

For all material used on this PO, Supplier shall provide a certificate (and make available to Viasat for review the underlying data that supports the provision of the certificate) that reads substantially as follows: "Raw materials used in this PO conform to all applicable PO requirements and are traceable to test reports at the point of manufacture."

12. (I) FIRST ARTICLE INSPECTION ("FAI")

Software: Supplier shall inspect the software developed under this PO pursuant to a Viasat-approved software qualification test ("SQT") and programmable logic ("PL"),and ensure that such article(s) satisfy all requirements in a Viasat-approved acceptance test.

Hardware: Supplier shall inspect a first article(s) manufactured under the first lot of the P/N and revision defined in the PO to validate conformance to applicable specifications and drawings referenced on the PO. Supplier shall provide Viasat with an inspection report ("FAIR") and the corresponding unit separated from the rest of the lot that contains the following information, at a minimum: (1) part number, part name and Supplier name; (2) requirement (nominal dimension); (3) range (tolerance zone); (4) results (actual dimension); and (5) name, signature and date from a QA representative. Supplier shall retain the inspection report and related data for a minimum of ten years or as defined by contract.

Supplier shall perform a delta FAI (i.e. a new FAI on the revised attributes of an article) and submit to Viasat for approval a delta FAIR in the following situations: (1) a first time build to a new revision of a drawing, or (2) a change to a part, material, process, critical equipment, plant location, or subcontractor.

For submission information see Supplier Submission and Communication Matrix see ref 1

12.A (UI) AS9102 FIRST ARTICLE INSPECTION

Supplier shall comply with all requirements set forth in QAPP 12. In addition, Supplier shall perform the FAI and issue an FAIR in accordance with the requirements set forth in AS9102 and PR000565 (FAIR Forms and Guidelines).

For submission information see Supplier Submission and Communication Matrix see ref 1

12.B. (UI). FIRST PIECE INSPECTION

Supplier shall perform a First Piece Inspection ("FPI") on *the first* finished article. FPI shall consist of an inspection to confirm conformance to all dimensions and tolerances specified in the applicable drawing. Supplier shall prepare and submit with shipment a First Piece Inspection Report ("FPIR") that contains the results of the FP

For submission information see Supplier Submission and Communication Matrix see ref 1.

12.C. (UI) 100% DIMENSIONAL INSPECTION

Supplier shall perform a FPI (as defined in QAPP 12.B) on *all* finished articles. FPI shall consist of an inspection to confirm conformance to all dimensions and tolerances specified in the applicable drawing. Supplier shall prepare and submit with shipment a FPIR (as defined in QAPP 12.B) that contains the results of the FPI.

For submission information see Supplier Submission and Communication Matrix see ref 1

15. (I) VIASAT SOURCE INSPECTION

Viasat reserves the right to perform source inspections at Supplier's facility. If deemed required, Supplier shall (1) schedule inspections through Viasat's Quality Assurance or Purchasing organizations, (2) provide the source inspector with a suitable working area, necessary tools and access to Supplier support personnel, and (3) inform Viasat as to the readiness of the product to be source inspected a minimum of 48 hours in advance of availability.

Supplier shall notify Viasat of shipment of material from lot(s) previously rejected by Viasat, and such lots shall be clearly identified as "resubmitted" items on the Supplier's shipping document. If the initial rejection resulted in a Viasat NMR this number shall be referenced on the Supplier's shipping documentation

15.A (I) SOURCE INSPECTION

Supplier shall comply with the PR000551 (Request For Source Inspection). Supplier shall provide a 48-hour written request for source inspection prior to Supplier shipments. Supplier will make every reasonable effort to logically group source inspection requests to minimize the number of separate visits required. Requests should be submitted to Viasat daily by 3:00PM.

19. (A) SECURITY CLEARANCE

Supplier shall supply evidence of government clearance (to the level specified by Viasat) by the Department of Defense for all personnel who will have access to classified information.

22. (A) SUPPLIER FAILURE REPORTING, ANALYSIS AND CORRECTIVE ACTION SYSTEM ("FRACAS") REQUIRED

Supplier shall provide a complete FRACAS report upon request. The report shall be in an "Eight Discipline" ("8D") or equivalent format to drive permanent Corrective Actions preventing reoccurrence, and specifically identify the actual cause of failure, failure mechanism, date code, serial numbers, and lot affected. Requests can be made by the Viasat Quality team for, but not limited to, the following reasons: Dominant Failure Modes, Early Life Failures (e.g., first year in operation), Sharp Uptick in Failure mode occurrence, Poor MTBF Field Performance of Product, etc.

For submission information see Supplier Submission and Communication Matrix [see ref 1]

23. (A) AGE CONTROL ELECTRONIC PARTS

Supplier shall deliver only parts manufactured less than five years prior to date of shipment, which shall be evidenced by date code markings on all parts as required by Original Component Manufacturer ("OCM").

24. (A) SUPPLIER'S QUALITY MANAGEMENT SYSTEM

Supplier shall maintain a documented quality management system that conforms to (i) ISO 9001 or AS9100, as appropriate; or (ii) another system acceptable to Viasat.

25. (A) CALIBRATION SYSTEM

Supplier shall calibrate, maintain and care for measurement and test equipment used in the performance of this PO in accordance with ANSI/NCSL Z540-1 or ISO 10012.1, and shall immediately notify Viasat in the event such equipment is found to be out of calibration.

34. (UI) UNIQUE IDENTIFICATION AND S/N

Hardware: Supplier shall identify each finished part with a unique, sequential serial number.

Software: Supplier shall identify the software with a unique version and build number.

35 / 35.A (UI) TEST & INSPECTION DATA

35 and 35.A combined, same submission for all sites.Supplier shall perform all electrical, visual and mechanical inspections and tests set forth in the applicable specification or drawing on all parts, and provide the data and results of such tests. For submission information see Supplier Submission and Communication Matrix [see ref 1]

35.B (UI) AS-BUILT TRACEABILITY RECORD

The As-Built parts and material lists shall be delivered per PR001294 (Contract Manufacture As-Built Procedure for Viasat Products) and the specific program quality plan (e.g., Product Assurance Plan). The supplier shall provide the data and test results required to Viasat per Supplier Submission and Communication Matrix [see ref 1]

36. (I) LIMITED LIFE/HAZARDOUS MATERIAL

Materials shall have (1) an effective date of manufacture, (2) an expiration date and (3) at least 75% of their limited life remaining when received by Viasat. Supplier shall include Safety Data Sheets with the first shipment of such materials.

36.A (A) DATE OF MANUFACTURE/LIMITED LIFE REQUIREMENTS

Materials shall have an effective date of manufacture that is within one year of being produced at the time of procurement. This shall be evidenced by the date code marking on all parts. Applicable Viasat Part Numbers will be defined within the PO.

39. (A) SUPPLIER DESIGN PRODUCT AND PART, MATERIAL AND PROCESS ("PMP") CHANGE CONTROL

Supplier shall not, without the prior written approval of the applicable Viasat Supply Chain representative, make any change in hardware, software or programmable logic requirements, design, or program management plan that would affect: (a) part number identification, (b) physical or functional interchangeability, (c) repair or overhaul procedures, (d) reliability, (e) safety or (f) compliance with applicable requirements or laws. Applicable change notification shall be sent using PR002403, Supplier Change Notification Form.

For submission information see Supplier Submission and Communication Matrix see ref 1

40. (A) VIASAT DESIGN PRODUCT AND PMP CHANGE CONTROL

Supplier shall provide Viasat with a detailed transition plan at least six (6) months prior to the introduction of any intended change to: (1) parts, materials, processes or critical equipment; or (2) manufacturing, processing or testing functions, including those of its subcontractors and/or sub-tier suppliers. Supplier shall obtain Viasat's written approval prior to implementing such changes. Applicable change notification shall be sent using PR002403, Supplier Change Notification Form.

For submission information see Supplier Submission and Communication Matrix see ref 1To the extent that an Approved Manufacturer List (AML) exists in Agile, Supplier shall purchase parts and materials exclusively from parties indicated on the AML.

41. (A) RESTRICTIONS ON PWA REWORK AND REPAIR

Supplier may Rework (as defined below) nonconforming material up to the maximum number of allowable Rework Cycles (as defined below) set forth in this paragraph. Hot air, infrared, laser and convection reflow technology (i.e., hot air pencil, hot air gun) may be reworked a maximum of three Rework Cycles, provided that no individual site (based on the reference designator) may be reworked more than once. Soldering iron, soldering pencil and tweezers iron technology may be reworked a maximum of fifteen Rework Cycles.

Supplier shall not Repair (as defined below) or use as is ("UAI") any nonconforming material without prior written authorization from the applicable Viasat Supply Chain representative. These conditions apply only to material purchased or manufactured by Supplier; they do not apply to material consigned to Supplier.

Per IPC-T-50H, "Terms and Definitions for Interconnecting and Packaging Electronic Circuits", the official definitions of Rework, Repair and Rework Cycle are:

> *Rework*: The act of reprocessing noncomplying articles, through the use of original or alternate equivalent processing, in a manner that assures compliance of the article with the applicable drawings or specifications. Example: Removal of solder bridges
>
> *Repair*: The act of restoring the functional capability of a defective article. In common usage, repair may restore the hardware to compliance with the applicable drawing or specification. In stringent (military) usage, rework is in compliance whereas repair restores functionality without being in compliance. Example: Addition of a jumper wire
>
> *Rework Cycle:* One rework cycle is defined as the removal and replacement of a component

44. (A) SUPPLIER MANAGEMENT OF VIASAT PRODUCT RECORDS

Supplier shall maintain records to provide evidence of conformity to requirements and of the effective operation of the Quality Management System for the longer of (1) ten years or (2) the contractually required document retention period. Records shall be indexed, legible and stored in a manner permitting easy access, retrieval and protection, and shall be made available to Viasat upon request.

46. (A) LEAD-LESS COMPONENTS ACCEPTANCE CRITERIA

Every PWA that contains a ball grid array ("BGA") or lead-less components shall be soldered according to J-STD-001 or other Viasat approved equivalent. BGA or micro-BGA sites shall be X-rayed perpendicular to and at a 45-degree angle to the PWA. X-ray photographs, which indicate the presence of voids in any solder ball or questionable joints of any kind, shall be re-taken at greater magnification and evaluated by the Supplier. Voids whose cross sectional area is greater than 25% of the solder pad must be evaluated and approved by Viasat Engineering and Quality Assurance. Supplier shall not perform any BGA rework without obtaining the prior written approval of Viasat Engineering and Quality Assurance.

Every BGA or micro-BGA site shall be X-rayed based on the following statistical sampling (or such tighter requirements set forth in the automated XRAY inspection ("AXI") process):

PWA Lot Size (X)	Number of PWA Samples
X < 10	2 (first of the lot and last of the lot)
10 < X < 50	4 (first and last of lot and 2 others of the lot)
X > 50	10% of lot size (first and last of lot and others as required)

The use of X-Ray Laminography or Digital Tomosynthesis with an equal or tighter sampling plan called out in a Statement of Work supersedes the X-Ray requirements of this requirement.

Supplier shall store all X-Ray, Laminography, Digital Tomosynthesis, photos and data records produced under this QAPP in accordance with QAPP 44. Supplier shall ensure that the records are retrievable by PWA part number, PWA serial number and component reference designator and shall provide to Viasat upon request.

46.A (A) LEADED (NON-RoHS) LEAD-LESS ACCEPTANCE CRITERIA

This requirement is not applicable for lead-free (RoHS) designs. Contact Viasat Supply Chain representative for clarification if it has been specified on a RoHS design.

Supplier shall test each BGA component via X-Ray Fluorescence ("XRF") or other Viasat-approved method to confirm the presence of lead in the solder balls. At a minimum, the testing shall be performed on one part from each package (tape & reel, tray, etc.) upon receipt and the first part used on each build. Supplier shall document all testing data in a manner that is auditable and retrievable upon request for the defined retention period.

47. (UA) TRACEABILITY OF COMPONENTS

All components (electrical, electronics and mechanical) on all delivered items, test data and reports shall be traceable to the original manufacturer, via lot or date code, PO, Certificate of Conformance or other supporting documentation. For each PWA, the Supplier shall provide traceability to each reference designator upon request.

48. (A) PRINTED WIRING BOARD ("PWB") AND/OR PWA SUPPLIER SELECTION

Supplier shall use a PWB and/or PWA Supplier who is on their approved sources list as prescribed in Viasat's Scope of Approval ("SOA"). Supplier selection must align to Viasat's metal value ranking assignment, as defined in Agile under 'Design Attributes', for alignment of the PWB and/or PWA design to the qualified supplier with at least the same metal value (i.e., Gold PWB design is fabricated at a Gold PWB supplier.) Reference Agile P/N 1365207 for list of current PWB suppliers and their metal ranking. Supplier may contact the Viasat Supply Chain representative for list of current PWA suppliers and their metal ranking. Supplier shall obtain written approval from the Viasat Supply Chain representative prior to placing a PO to a PWB and/or PWA Supplier not on Viasat's SOA. To facilitate Viasat's review and approval, Supplier shall provide Viasat with:

(a) Written notice of intent to use a different PWB and/or PWA Supplier than one approved in Viasat's SOA no later than 10 days after receipt of the Viasat PO. Such notice shall include all relevant details about the PWB and/or PWA Supplier, including the location of Supplier's manufacturing facility.

(b) Supplier's current PWB and/or PWA Supplier quality evaluation, which (to the extent available) shall include no less than six months of incoming quality data (e.g. first pass yield and defects summaries) and post-receiving testing, processing and build rejection information.

49. (I) SPECIAL PROCESSING

Supplier shall identify and obtain written approval from the Viasat Supply Chain representative prior to performing any manufacturing steps or processes that limit Viasat's ability to physically or visually inspect the post-processing deliverable ("Special Processing"). To facilitate Viasat's review and approval, Supplier shall provide Viasat with detailed information about all aspects of the Special Processing, including the equipment used, process change control procedures, process operations and parameters, and process, equipment and personnel qualifications. If approved, Supplier shall include on the Certificate of Conformance the name, specification number, type, and class of material or process used in the Special Processing.

50. (I) PWB AND EMS FAB DATA

The PWB supplier shall comply with the following requirements:

(a) Solder samples can have electrical and/or mechanical failures but cannot have holes or cutouts that would affect the reflow profiling process (thermal mass, constraint, etc.).

(b) For PWB's that are in an array form, the entire panel shall be provided for reflow profiling. Exceptions to providing arrays can be dealt with on a case-by-case basis.

(c) Cross-section report, including data, results and pictures. The cross-section puck shall not be sent.

(d) 100% Net List testing data results certification.

The EMS supplier shall comply with the following requirements:

(a) The reflow profiling process shall follow Viasat's SURFACE MOUNT TECHNOLOGY (SMT) REFLOW PROFILE SPECIFICATION 1141100.

(b) Include a zero-dollar line item on their PO to the PWB supplier when requesting solder samples.

(c) Request a minimum of two no-cost solder reflow profiling samples on each order for the Electronic Manufacturing Services (EMS) Supplier process development (i.e. reflow profiling).

PWB Suppliers shall provide the items above to Viasat or Viasat's EMS Supplier with each delivery. Non-PWB Suppliers who provide assemblies that incorporate PWBs (e.g. PWAs or flex cables) shall maintain and make the items above available to Viasat upon request.

For submission information see Supplier Submission and Communication Matrix [see ref 1]

50.A (I) INTERCONNECT STRESS TESTING ("IST")

Supplier shall perform IST in accordance with IPC-TM-650, Number 2.6.26A, and, promptly following completion, shall provide Viasat the IST Test Report. The PO shall identify whether (1) baseline testing, (2) lot-to-lot acceptance testing or (3) skip lot testing is required. For Space Flight PWBs, supplier shall perform IST, as identified on PWB drawings, per PR002663, per Method A, with Assembly Preconditioning, and with Micro-section Analysis performed on all failing test coupons.

For submission information see Supplier Submission and Communication Matrix [see ref 1]

50. B (I) D-COUPON TESTING

Supplier shall perform D-coupon testing in accordance with IPC-TM-650, Test Number 2.6.27 & 2.6.7.2, and, promptly following completion, shall provide Viasat the D-coupon Test Report. The PO shall identify whether (1) baseline testing, (2) lot-to-lot acceptance testing or (3) skip lot testing is required. For Space Flight PWBs, supplier shall perform D-coupon testing, as identified on PWB drawings, per PR002662, with Assembly Preconditioning, and with Micro-section Analysis performed on all failing test coupons

The test plan below indicates to the PWB Supplier the number of panels to go through D-Coupon testing. If any of the panels fail testing the entire the entire lot shall go through D-Coupon test.

	Number of Panels	Panels for testing (in processing sequence)
B.1	5 panels or less	first, third, and fifth panel
B.2	1 to 20 panels	first, fifth, tenth, fifteenth, and twentieth panel
B.3	1 to 50 panels	first, tenth, twentieth, thirtieth, fortieth, and fiftieth panel

In any lot quantity scenario where a lot does not fit above panel quantity, the last panel of the lot shall go through test to ensure the lot is indicative of a homogenous process.

Example: A lot of 24 panels would follow B.3 plus the last panel for test (panel 24)

For all space related PWBs 100% of the panels must be tested (no lot sampling of panels permitted).

For submission information see Supplier Submission and Communication Matrix [see ref 1]

50. C (I) REQUIREMENTS FOR FLYING PROBE TESTING

Supplier shall perform Flying Probe testing in accordance with PR002806 as described on the PWA drawing, and, promptly following completion, shall provide Viasat the Flying Probe test results as described in PR002806.

50. D (I) PROVIDE IPC-2221 CONFORMANCE TEST COUPON(S)

Supplier shall provide the requested coupon(s) as defined in the latest version of IPC-2221 Appendix A, Table A.1-1 IPC Coupons.

As applicable, the coupon(s) should be conditioned and fully processed (e.g. thermally stressed and micro-sectioned) before delivery to Viasat.

This QAPP will be invoked by referencing “50D:” followed by the coupon designation(s). For example, a request for Coupons AB/R and D, the QAPP will appear as “50D: AB/R, D”.

51. (A) REQUIREMENTS FOR CABLE & WIRE HARNESS ASSEMBLIES

Supplier shall ensure that all cable and wire harness assemblies comply with the latest revision of IPC/WHMA-A-620, Requirements and Acceptance for Cable and Wire Harness Assemblies, with sufficient in-process inspections to demonstrate full compliance (see IPC/WHMA paragraphs pertaining to Process Control). All operators and inspectors involved in the production and acceptance inspection of cables shall be trained and certified to IPC/WHMA-A-620. Operators performing basic routing, installation, and connector mating, only, do not require official IPC certification (unless otherwise specified in contract or SOW) but should be familiarized with the risks of damaging assemblies during these processes, the IPC/WHMA acceptance requirements for installation and routing, and the proper mating process for connectors.

All cable and wire harness electrical acceptance tests shall be performed in production. If specific testing values are not provided on an assembly drawing, the values listed in IPC/WHMA-A-620 or 1448118, for specific exceptions, shall apply. If an assembly drawing explicitly omits insulation resistance and/or dielectric withstanding voltage testing or otherwise contradicts this QAPP, refer to the applicable order of precedence (i.e., QAPP X, PR001076, or other program-specific document). Contact Viasat Quality Engineering for clarification. Tests shall be performed using only the appropriate mating connectors or mating pins. Probing of deliverable connector pins and sockets with multimeter leads, bare wire, or incorrect mating pins/sockets, is prohibited. All test results shall be documented in the build documentation and shall clearly correlate to the point-to-point connections of the assembly in accordance with the associated wire list or wiring diagram.

All mechanical crimp connections shall be verified as satisfactory by performing a crimp pull test for every combination of crimp contact, wire type/size (strand count, AWG), and tool setting (i.e., adjustable M22520 tools). Crimp pull tests shall be conducted on crimp samples only, and not be performed on deliverable hardware. Results shall be recorded in the build documentation for each assembly. “Go/no go" gauging of all crimp tools, and/or crimp height measurements shall be performed periodically to validate that each tool is operating nominally.

52. (I) KEY PERFORMANCE CHARACTERISTIC (“KPC”)

Software: Viasat shall identify KPCs in the PO and/or Systems Requirements Review. Supplier shall provide software and programmable logic that meets all KPCs.

Hardware: Viasat shall 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 to Viasat 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 Viasat's Quality 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."

53. (UI) WARRANTY EXPIRATION DATES AND S/NS

Supplier shall provide the (1) warranty expiration date and (2) serial number on the Shipping Document (Shipper) for each item.

54. (A) USE OF NON-FRANCHISED DISTRIBUTORS & BROKERS

Supplier shall procure all electronical, electronic and electromechanical ("EEE") components from (listed in order of precedence) (1) the Original Equipment Manufacturer ("OEM")/ Original Component Manufacturer ("OCM") or their Authorized licensed Franchised Distributors, (2) the Authorized Aftermarket Manufacturer in PR002013 or (3) Approved Non-Franchised Distributors in PR002013. Approved Non-Franchised Distributors/Test Laboratories shall test & submit an Authentic Validation Test Report in accordance with SAE AS6081* to this URL (Viasat Partner Collaboration portal) for Quality approval before shipment. An approved hard copy of the test report shall be provided with the shipment. In the event a components' date code is older than 5 years, a solderability test shall also be completed in the test report. Supplier shall include and flow down this requirement to all sub-tier suppliers for EEE components.

***Exception: For Multilayer Ceramic Capacitor only: AS6081 level A3 (Solvent, Scrape Test, SEM), A4 (X-Ray), and A6 (Decap) are not required. It is required to perform AS6081 level C (Electrical Testing) using an LCR meter with Automatic Level Control or Curve Tracer equipment. This shall be performed on 116 random devices if the lot size is greater than or equal to Qty 200 (for tape and reel), or all devices if lot size is less than Qty 200. The 116 loose & tested devices shall be scrapped (do not ship or place back in tape and reel).**

55. (I) REPAIR/SERVICE REPORTING

Supplier shall provide an electronic service and repair report which shall include the following information:

(a) Item being repaired, including Viasat part number and revision.
(b) Item S/N
(c) Viasat Return to Manufacturer Authorization ("RMA") number/Supplier RMA number and reference to Viasat Non-conformance Material Report ("NMR") # (if available)
(d) Failure symptom observed
(e) If applicable, item sub-assembly part number and S/N
(f) Item or reference designator affected by repair
(g) Action taken - replaced, repaired, scrapped, adjusted, use as is, no problem found
(h) Date of repair and/or test activity
(i) Repair / test technician

Upon shipment, Supplier shall send the test data, results of such tests and service, and repair report in accordance to latest requirements in Supplier Submission and Communication Matrix see ref 1

55. A (A) DEPOT REQUIREMENTS

Supplier must commit to capability for both In Warranty (IW) and Out Of Warranty (OOW) repairs of all products manufactured or assembled. Supplier shall have plans/resources designated to perform repairs on returned products when those occur. The turnaround time (TAT) for those returns should be called out in a depot statement of work (SOW) and in the absence of that existing, supplier should adhere to a 30 (thirty) day turnaround time requirement. To meet these requirements, the supplier is responsible to hold any material necessary to complete these repairs along with aforementioned personnel necessary to execute.

56. (UA) FAA REPAIR – DRUG & ALCOHOL PREVENTION PROGRAM

Supplier shall ensure that all U.S.-located personnel of supplier and its subcontractors performing "hands on" work on commercial aviation material must be included in an FAA-registered drug and alcohol abuse prevention program in accordance with 49 CFR Part 40 "Procedures for Transportation Workplace Drug & Alcohol Testing Program" and 14 CFR Part 120 "Drug & Alcohol Testing Program." Supplier shall provide evidence of participation in a compliant drug and alcohol program that meets these regulations.

57. (A) FOREIGN OBJECT DEBRIS ("FOD") / FOREIGN OBJECT ELIMINATION ("FOE") PROGRAM

Supplier shall maintain a documented FOD/FOE program that includes, 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 Viasat 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.

58. (UA) PWB VERIFICATION & DESTRUCTIVE PHYSICAL ANALYSIS ("DPA") SAMPLES

Supplier shall perform third party inspection for PWB verification per PR001362 (Third Party Inspection Services, PWB Verification and DPA Samples).

60. (A) ENGINEERING PROCESS

Supplier shall prepare engineering development plans and processes that define the following:

(a) Program management structure
(b) Management oversight and progress tracking measures, including Program Monthly Reviews ("PMRs")
(c) Engineering lifecycle approach
(d) Engineering environment, tools, and file management
(e) Milestones for System Requirements Review ("SRR"), Preliminary Design Review ("PDR"), Critical Design Review ("CDR"), and Test Readiness Review ("TRR")
(f) Work Breakdown Structure ("WBS") that includes configuration items
(g) Risk management, including risk planning, identification and analysis (likelihood criteria, consequence criteria), risk mitigation, and continuous risk monitoring and reassessment
(h) Requirements management with bidirectional traceability to design and test
(i) Configuration Management ("CM") and change control
(j) Peer review requirements prior to change control
(k) Action item and problem tracking
(l) Test and verification
(m) Release process and authorization
(n) Quality oversight and audits

Supplier shall submit the engineering development plans and processes to Viasat for review and written approval. Supplier shall promptly incorporate and address Viasat's feedback, if any. Supplier shall maintain engineering records that include files, records, minutes and other artifacts of the development planning effort above.

62. (I) ENVIRONMENTAL PRODUCT REQUIREMENTS

Supplier shall comply with all environmental product requirements set forth in the drawings, specifications or special note(s) in the PO. If required, Supplier shall comply with all compliance and declaration requirements set forth in PR000608 (Environmental Quality Assurance Procurement Provisions E-QAPP), which covers requirements for current EU Directives such as (a) ROHS Directive ("RoHS"), (b) REACH Regulation ("REACH"), (c) WEEE Directive, (d) Packaging Directive, (e) US TIPPA packaging requirements, (f) Battery Directive, (g) California Proposition 65, and (h) other prohibited or restricted substances. Product must meet US TSCA prohibited hazardous chemicals and provide statement of compliance. 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 Viasat products. Supplier shall upload required certifications into OSQRE if the supplier has been onboarded into the OSQRE system.

For submission information see Supplier Submission and Communication Matrix[see ref 1]

63 A. (I) DECLARATION OF CONFORMITY PRODUCT REQUIREMENTS

Supplier/manufacturer shall comply with all European Directives currently in force for the equipment type and provide a Declaration Of Conformity, (DOC). The DOC will indicate the current safety and EMC directives and dated standards the equipment was tested against. Should the directives or standards be revised and adopted in the European Official Journal (OJ) the supplier will provide an updated DOC to show compliance with the new requirements. This will be provided upon any new purchase within 6 months of the OJ official acceptance. The DOC will be dated and signed by a representative of the supplier/manufacturer.

The DOC in this QAPP allows for the incorporation of QAPP 62 DOC so as to reduce multiple DOC's on record.

Supplier shall submit declaration to Viasat for approval in the following situations: (1) a first time build of a product, (2) a change to a part, material, process or a revision of a product, (3) a change to this regulation.

63 B. (I) CE OR CB SAFETY REPORT FOR EUROPEAN AND UK COMPLIANCE

The CE or CB safety report will either be provided to Viasat for purposes of homologation of equipment into other countries or at Viasat's request be provided to certification agencies directly. Should the report only be allowed to be provided to a certification agency the supplier/manufacturer will provide the report to the agency within 2 weeks of request. The safety reports should be from an accredited 3 party test facility and not self-testing or evaluation. The safety report shall indicate dated standards that match the DOC indicated in QAPP 63.

Supplier shall submit declaration to Viasat for approval in the following situations: (1) a first time build of a product, (2) a change to a part, material, process or a revision of a product, (3) a change to this regulation.

63 C. (I) EMC TEST REPORT

The EMC report will either be provided to Viasat for purposes of homologation of equipment into other countries or at Viasat's request be provided to certification agencies directly. Should the report only be allowed to be provided to a certification agency the supplier/manufacturer

will provide the report to the agency within two (2) weeks of the request. The EMC reports should be from an accredited third party test facility and not self-testing or evaluation. The EMC report shall indicate dated standards that match the DOC indicated in QAPP 63.

Supplier shall submit declaration to Viasat for approval in the following situations: (1) a first time build of a product, (2) a change to a part, material, process or a revision of a product, (3) a change to this regulation.

63 D. (I) NRTL CERTIFCATE OF COMPLIANCE FOR NORTH AMERICA

For North American safety approvals, a NRTL certificate, or Yellow Card as they are referred to, shall be provided to show compliance to North American safety standards. North American safety approvals are only accepted if provided by an approved Nationally Recognized Testing Laboratory (NRTL). Further specific details include:

(a) Complete equipment: For example, off the shelf Wi-Fi routers, power supplies, etc. - provide a certificate of compliance or a yellow card.

(b) Materials to construct devices: For example, wiring, plastic connectors, outdoor rated connectors - provide a certificate of compliance or a yellow card for the individual components.

(c) Outsourced constructed devices: For example, provide a Nationally Recognized Test Laboratory (NRTL) certificate of compliance or a yellow card.

(d) Military/Government equipment: Should devices be used exclusively for military or government purposes, this QAPP is not required unless a North American safety compliance is required in the contract. Typically, MIL STD requirements would be required in this instance.

Supplier shall submit declaration to Viasat for approval in the following situations: (1) a first time build of a product, (2) a change to a part, material, process or a revision of a product, (3) a change to this regulation.

64 . (I) FCC ID AND ISED ID NUMBER FOR INTENTIONAL RADIATOR EQUIPMENT

For all equipment that has an intentional radiator or any other reason determined by the FCC or IC intended to be sold in North America and/or Canada a FCC and/or ISED ID number shall be provided.

Supplier shall submit declaration to Viasat for approval in the following situations: (1) a first time build of a product, (2) a change to a part, material, process or a revision of a product, (3) a change to this regulation.

Acronyms

8D: Eight Discipline

AML: Approved Manufacturer List

AXI: Automated XRAY Inspection

BGA: Ball Grid Array

C of C: Certificate of Compliance

CB: Certification Body test certificates

CE: Conformité Européenne – French for European Conformity

CDR: Critical Design Review

CM: Configuration Management

COTS: Commercial Off The Shelf which defined as: Any parts or assembly that is contained in a Manufacturer or Distributor catalog, whose configuration is controlled by the Manufacturer and which is offered for sale to the general public.

DPA: Destructive Physical Analysis

DOC: Declaration of Conformity

EMC: Electromagnetic Compatibility

EMI: Electromagnetic Interference

EMS: Electronics Manufacturing Services

E-QAPP: Environmental Quality Assurance Procurement Provisions

FAI: First Article Inspection

FAIR: First Article Inspection Report

FCC: Federal Communications Commission

FOD: Foreign Object Debris

FOE: Foreign Object Elimination

FPI: First Piece Inspection

FPIR: First Piece Inspection Report

FRACAS: Failure Reporting and Corrective Action System

IAQG: International Aerospace Quality Group

ISED: Innovation, Science and Economic Development Canada

IST: Interconnect Stress Testing

IW: In Warranty

KPC: Key Performance Characteristic

LVD: Low Voltage Directive

Quality Assurance Procurement Provisions – QAPPs

NAFPI: National Aerospace FOD Prevention, Inc.

NMR: Non-conformance Material Report

NRTL: National Regulatory Test Laboratories

OCM: Original Component Manufacturer

OEM: Original Equipment Manufacturer

OOW: Out of Warranty

OSQRE: Operations Supplier Quality Record Exchange

PAP: Product Assurance Plan

PDR: Preliminary Design Review

PL: Programmable Logic

PMP: Part, Material, and Process

PMR: Program Monthly Review

P/N: Part Number

PO: Purchase Order

PWA: Printed Wiring Assembly or PCBA (Printed Circuit Board Assembly)

PWB: Printed Wiring Board, or bare board, or PCB (Printed Circuit Board)

QA: Quality Assurance

QAPP: Quality Assurance Procurement Provision

RDE: Responsible Design Engineer

REACH: Registration, Evaluation and Authorization of Chemicals

RMA: Return to Manufacturer Authorization

RoHS: Restriction of Hazardous Substances Directive 2002/95/EC

SCIP: Substances of Concern In Products

SDS: Safety Data Sheet (formerly MSDS)

SOA: Scope of Approval

SOW: Statement of Work

SQT: Software Qualification Test

S/N: Serial Number

TAT: Turnaround Time

TRR; Test Readiness Review

TSCA: Toxic Substances Control Act

UAI: Use As Is

WBS: Work Breakdown Structure

WEEE: Waste Electrical and Electronic Equipment

XRF: X-Ray Fluorescence

REFERENCE: All reference Viasat documents (usually has prefix PR) are available on the Viasat website, in Supplier Information section.

Note: QAPP numbering order may have gaps due to deleted provisions.

1 – Supplier Submission and Communication Matrix is located at https://www.viasat.com/supplier-information/quality-documents/. This will provide the latest information on the primary and secondary submission and communication protocols to also include guidance for FOUO, CUI, NDA or other similarly controlled information.