

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

ELECTRONIC PART COUNTERFEIT RISK MITIGATION

1. SCOPE

- 1.1. Revision 8 replaces revision 7 dated 10/10/2013.
 - 1.1.1. Revision 8 is standardized format and clarified wording and structure of requirement. Enhancements to Part Number in the test report and considerations for bare dies were added, as well as the addition of footnotes in Table 1 and clarifications in Appendix A.
- 1.2. The applicable revision of this document is determined by:
 - 1.2.1. The revision specified on the purchase order, or
 - 1.2.2. The revision in effect at the time of the purchase order if no revision is listed on the purchase order
- 1.3. The purpose of this document is to ensure Raytheon suppliers and their sub-tier suppliers perform electronic part counterfeit risk mitigation.

2. APPLICABLE DOCUMENTS

- 2.1. The following documents are referenced in Sections 3 and 4 of this document
- 2.2. Raytheon Specifications
 - 2.2.1. Certificate of Test Completion
- 2.3. Other Specifications
 - 2.3.1. IDEA-STD-1010
 - 2.3.2. IPC/EIA-J-STD-002
 - 2.3.3. AS6081

3. REQUIREMENTS

- 3.1. The word "shall" invokes a binding requirement for the supplier to meet.
- 3.2. General Requirements
 - 3.2.1. The supplier shall ensure the material supplied on this order is the Original Component/Equipment Manufacturer (OCM/OEM) referenced on the Purchase Order, Raytheon Drawing, or as indicated by the manufacturer's unique part number.
 - 3.2.2. The supplier shall mark the material in accordance with the applicable procurement document, whether it is a Military Specification Standard

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

Microcircuit Drawing (SMD), Raytheon control drawing or Manufacturer's Data Sheet.

- 3.2.2.1. Any unauthorized marking or remarking of components is prohibited.
- 3.2.3. The Seller shall use the inspections and tests contained in Table 1 to verify that the material conforms to this Quality Note, unless otherwise specified in this purchase order.
- 3.2.4. The Seller shall utilize a test and inspection laboratory capable of performing the required inspections and tests and have Raytheon's concurrence in writing.
 - 3.2.4.1. Raytheon may elect to perform some or all of the testing using a Raytheon test laboratory.
- 3.2.5. The Seller shall contact the Raytheon Procurement Agent to confirm the Raytheon preferred method of laboratory testing (Internal or External).
- 3.2.6. The Seller shall ensure that the inspections and tests meet the requirements listed in this document.
- 3.2.7. The Seller shall provide separate inspection data reports for each component date code / lot code.
- 3.2.8. The Seller's inspection data reports shall include:
 1. Original manufacturer's name
 2. Raytheon purchase order number
 3. Raytheon part number as specified on the purchase order
 - a. If no Raytheon part number is specified on the purchase order, the Seller's part number shall be used.
 - b. If no Seller's part number is specified on the purchase order, the material descriptor shall be used.
 4. Raytheon drawing revision (including change notices, if not part of revision level) when specified on the purchase order
 - a. If no Raytheon drawing revision is specified on the purchase order, then no drawing revision is required.
 - b. Note: "Rev –" is a Raytheon convention to denote first release. If "Rev –" is used by Raytheon, the Seller shall record the

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

revision as “Rev –“ and not as “N/A” or leave the revision blank.

5. Component date code & lot code
 6. Test/Inspection results, conditions, and parameters
 7. Quantity of parts tested
 8. Serial numbers (where applicable)
 9. Date of test/inspection
 10. Inspector identification
 11. Seller’s authorized agent’s name, position, and date. Note: Electronic signature is acceptable.
- 3.2.9. The Seller shall report any evidence of counterfeit parts encountered during Inspection or Test to Raytheon, ERAI, and the Government Industry Data Exchange Program (GIDEP).
- 3.2.10. If multiple date codes / lot codes are shipped in the same container, the Seller shall place the each date code / lot code in separate packages marked with the date code / lot code.
- 3.2.11. The Seller shall retain test samples as part of the quality record associated with this purchase order.
- 3.2.12. The Seller shall have destruct test samples made available to the Raytheon Procurement Agent upon request.
- 3.2.13. The Seller shall provide the name and location of the 1st tier supplier providing the material to the Seller.
- 3.2.14. The Seller shall address all correspondence to the Raytheon Procurement Agent.
- 3.2.15. The Seller shall retain the test data for a minimum of 5 years from the completion this Purchase Order unless otherwise specified.

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

Table 1

Inspection/Test	Requirement	Sample Size
Packaging Inspection and OEM/OCM history investigation	Verification that package marking is consistent with the OEM marking and that the date / lot code is not later than the last production date. For Qualified Parts List (QPL) parts, verify that the manufacturer identified on the package was a QPL source for the time period represented by the part date / lot code.	3 parts from each date code <u>1/</u>
External Visual Inspection (N/A for bare die)	IDEA-STD-1010, 20 X magnification minimum, 50 X or greater may be used to detect counterfeiting	100% up to 45 pieces and minimum 45 piece sample for lots greater than 45 pieces
Mechanical Inspection (N/A for bare die)	IDEA-STD-1010 paragraph 10.3.3	20 parts from each data code
Marking Permanency (N/A for bare die) <u>2/</u>	Using the following in the order specified: 1) 3 parts Mineral Spirits, 1 part Isopropyl Alcohol mixture, 2) Acetone	3 parts from each date code <u>1/</u>
Blacktop Testing (N/A for bare die) <u>2/</u>	1) 1-Methyl 2- Pyrrolidone (AS6081), 2) Dynasolve 750 solution (AS6081), 3) Scrape Test (IDEA 1010.3.2.3)	3 parts from each date code <u>1/</u>
Delid/Decapsulation (for bare die see <u>3/</u>)	Component Decap (cavity devices only) and die photograph to compare die marking to external part marking, OEM/OCM die maps or datasheet or known good die, if available	3 parts from each date code <u>1/</u>
Lead Cross-Section	For metal can, through hole packages such as TO-99, TO-100, TO-8, etc. All device leads must be cross-sectioned in order to determine if leads have been extended by welding	3 parts from each date code, all leads(may be performed on the Delid/Decapsulation sample) <u>1/</u>
Solderability (N/A for bare die)	per IPC/EIA-J-STD-002	3 parts from each date code <u>1/</u>
X-Ray Fluorescence (N/A for bare die)	Termination finish composition	3 parts from each date code <u>1/</u>
Electrical (for bare die see <u>4/</u>)	Test in accordance with commodity matrix in Appendix A herein	100%
Radiographic Inspection (N/A for bare die)	Radiographic Inspection of the die and internal construction of the product	100%

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

Inspection/Test	Requirement	Sample Size
Test Inspection Data	The Seller shall submit a test and inspection data report to Raytheon for review, approval and disposition prior to shipping the part. The Seller or the Seller's test laboratory shall complete the checklist attached to this Quality Note which will serve as a summary cover sheet that is supported by all additional detailed test data, results, images, and photographs. No shipments of material can be made without report review and written confirmation of approval by Raytheon's buyer via a COTC	
Certificate of Test completion (COTC)	The Seller shall submit an approved COTC with each shipment of material to Raytheon	

- 1/ Performance of multiple tests on the same samples is allowed to maximize yield
- 2/ As applicable for device package materials and marking
- 3/ For bare die, perform die inspection to compare die marking to OEM/OCM die maps, datasheet, or known good die, if available. After the die inspections have been completed, select three samples and perform cross section analysis. Compare the various die layer characteristics against the known die information (i.e. die thickness, backside plating layer material and thickness, passivation characteristics and material type, number of metal layers, etc.), and verify uniformity between the samples (and compare to cross sections of known good die if available).
- 4/ For bare die a 10 piece sample shall be assembled for electrical testing and tested to the corresponding commodity type per Appendix A. 100% electrical probe testing may be performed in lieu of assembly.

**Raytheon Quality Note
GP**

**Revision - Date
8 – 10/27/2015**

APPENDIX A

Note: If required, electrical test at temperature extremes will be specified by Purchase Order

Commodity Name	Commodity Code	Electrical Test Requirement
Hybrid-ASIC-MCM Materials (Applies to bare die only - UCC 00801)	008XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
RF/Microwave Waveguide Devices and Assemblies	022XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Electrical Items	024XX	All Electrical parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Magnetics (Inductors, Coils, Ferrites, Transformers, Transducers)	027XX	All Electrical parameters at room as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Batteries	031XX	All Electrical parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Semiconductors (Microcircuits including programmable memory, Discretes)	036XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order. All programmable devices must be free from embedded software/firmware and shall be confirmed as blank.
ASICs & PASICs (ASICs, PALs, FPGAs, CPLDs)	037XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order. All programmable devices must be free from embedded software/firmware and shall be confirmed as blank.
Hybrids	038XX	All DC, Functional, Switching/AC parameters at room as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Capacitors	039XX	Test parameters (Capacitance, Dissipation factor, DWV, IR, DC leakage, ESR) at room as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

Commodity Name	Commodity Code	Electrical Test Requirement
Resistors	040XX	Test parameters (Resistance, DWV, IR) at room as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Switches & Relays	042XX	All Electrical parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Connectors	044XX	Test parameters (Contact & Insulation resistance, Contact retention, DWV, Shell to shell conductivity, Electrical engagement) at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
E-Fiberoptic Assemblies	045XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
RF/Microwave Devices (Non Waveguide)	046XX	All DC, Functional, Switching/AC parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.
Servo Components	056XX	All Electrical parameters at room temperature as specified in the Raytheon Technical Data Package (drawing), military drawing, manufacturer's data sheet or other specific tests required by the purchase order.

4. DATA SUBMISSION

- 4.1. Supplier to deliver the following data to Raytheon for Raytheon Approval
 - 4.1.1. Inspection data reports for each component date code / lot code per Section 3.2.7.
 - 4.1.2. Certificate of Test Completion per Table 1

5. NOTES

- 5.1. Order of Precedence – Conflicts between this document and other provisions within the Purchase Order are defined in the Terms & Conditions (TC-001)
- 5.2. This Quality Note requires use of a Certificate of Test Completion (COTC). The COTC form is located on the Raytheon Quality Notes website (<http://qnotes.raytheon.com>), adjacent to this Quality Note. The COTC is to be

Raytheon Quality Note
GP

Revision - Date
8 – 10/27/2015

completed by Raytheon and issued to the Seller and signifies acceptability of the test results.