Blue Canyon Technologies

Counterfeit and Fraudulent Parts Mitigation SOW

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Deployment is required for any revision change of this document. Deployment instructions: MARCOM to update https://www.bluecanyontech.com/suppliers/ and send an email to purchasing@bluecanyontech.com alerting them that a new revision of this document has been released.

Change Record

Issue	Date	Section(s)	Description of Change
A	SEE PLM System	All	Initial Release
B	SEE PLM System	All	Updated to incorporate lessons learned in first procurements. Removed electrical testing requirement
C	SEE PLM System	All	Add passive part test flow, update sample size to standard supplier flow

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1 Scope

This document describes the process to be performed when procurement is from a supplier who is not an Authorized Distributor of the Original Equipment Manufacturer. It defines processes for preventing the introduction of suspect or counterfeit material into Blue Canyon Technologies (BCT) products.

The supplier **shall** provide all resources (labor, materials, facilities, etc.) needed to provide the deliverables defined in Table 1.

Table 1: Supplier Provided Items

Deliverable Item No.	Description	Quantity	Technical Specifications
1	The OEM part number provided on the PO	See PO	
2	Inspection Data Report and Checklist	1	See 3.16
3	Approved Certificate of Test Completion (COTC)	1	See 3.17

2 References

2.1 Applicable Documents

AS6171 Test Methods Standard; General Requirements, Suspect/Counterfeit, Electrical, Electronic, and Electromechanical Parts

SAE AS6171/2 Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods

SAE AS6171/3 Techniques for Suspect/Counterfeit EEE Parts Detection by X-ray Fluorescence Test Methods

SAE AS6171/4 Techniques for Suspect/Counterfeit EEE Parts Detection by Delid/Decapsulation Physical Analysis Test Methods

SAE AS6171/5, “Techniques for Suspect/Counterfeit EEE Parts Detection by Radiological Test Methods

SAE AS6171/7 Techniques for Suspect/Counterfeit EEE Parts Detection by Electrical Test Methods

IDEA-STD-1010 Acceptability of Electronic Components Distributed in the Open Market

2.2 Terms and Definitions

Terms and Definitions shall be as defined in AS6171.

3 Requirements

3.1 Seller shall ensure material supplied on this purchase order is the Original Component/Equipment Manufacturer (OCM/OEM) referenced on the purchase order, BCT Drawing, or as indicated by the manufacturer's unique part number.

3.2 Seller shall mark the material in accordance with the applicable procurement document, whether it is a Military Specification Standard Microcircuit Drawing (SMD), BCT control drawing or Manufacturer's Data Sheet.

3.2.1 Any unauthorized marking or remaking of components is prohibited.

3.3 Seller shall monitor and act on GIDEP alerts and report any evidence of counterfeit or suspect counterfeit parts encountered during inspection or test to BCT, ERAI, and the Government Industry Data Exchange Program (GIDEP).

3.4 Seller shall use the inspection and test requirements detailed below to verify the material conforms to this document, unless otherwise specified in the purchase order.

- For both complex and simple active electronic parts the seller shall use the inspection and test requirements contained in Table I.
- For passive electronic parts inspection and test shall be per AS6171, Low Risk, Model 1. Sample size shall be per AS6171.

3.5 Seller shall utilize a test and inspection laboratory capable of performing the required inspection and tests and shall be responsible for overseeing the accuracy of laboratory results.

3.5.1 BCT may elect to perform some or all the testing using a BCT test laboratory.

3.6 Seller shall contact the BCT Buyer to confirm the BCT preferred method of laboratory testing (Internal or External).

3.7 Seller shall ensure the inspections and tests meet the requirements listed in this document.

3.8 Seller shall provide separate inspection data reports for each component date code/lot code (homogeneous batch).

3.8.1 A homogeneous batch is parts with the same date code and lot code. If either the date code or lot code is different, this constitutes a new homogenous batch.

Each homogeneous batch shall be identified and segregated to ensure lot integrity during inspections and tests.

3.9 Seller's inspection data report shall include:

- Original manufacturer's name
- BCT purchase order number
- BCT part number as specified on the purchase order:
  - If no BCT part number is specified on the purchase order, the Seller's part number shall be used.
  - If no Seller's part number is specified on the purchase order, the material description shall be used.
- BCT drawing revision (including change notices, if not part of revision level) when specified on the purchase order:
  - If no BCT drawing revision is specified on the purchase order, then no drawing revision is required.
- Component date code & lot code
- Test/inspection results, conditions, and parameters
- Quantity of parts tested
- Serial numbers (where applicable)
- Date of test/inspection
- Inspector identification
- Seller's authorized agent's name, position, and date (Electronic signature is acceptable).

3.10 If multiple date codes/lot codes are shipped in the same container, the Seller shall place each date code/lot code in separate packages marked with the date code / lot code.

3.11 Seller shall retain test samples as part of the quality record associated with this purchase order and the record retention requirements conveyed on this purchase order.

3.12 Seller shall have Destructive Physical Analysis (DPA) test samples made available to BCT upon request.

3.13 Removed, not applicable.

3.14 Seller shall address all correspondence to the BCT Buyer.

3.15 Seller or laboratory shall not deem any tests "n/a" without prior written BCT concurrence unless otherwise specified in Table I below.

3.16 The Seller shall submit a test and inspection data report to BCT for review, and approval prior to shipping the part(s). The data requirements are contained in the checklist in Appendix A. The Seller or the Seller's test laboratory shall provide a summary cover sheet supported by all detailed test and inspection results including pass/fail, images, and photographs. No shipments of material can be made without report review and written confirmation of approval by BCT's Buyer via a Certificate of Test Completion (COTC) in Appendix B.

3.17 The Seller shall submit an approved COTC with each shipment of material to BCT.

4 Verification

4.1 Verification testing for Active Electronic parts shall consist of the inspections and tests detailed in Table I.

Table I Authentication Testing for Active Electronic Parts

Inspection/Test	Requirement	Sample Size
Documentation Review	Verify package materials are consistent with datasheet and documents contain no alterations. Check lot/date code against GIDEP database. Document findings, provide photos of noted labels and bag/tag information	
Packaging Inspection and OEM/OCM history investigation	IDEA-STD-1010 Paragraph 10.1 Verification that package marking is consistent with OCM/OEM marking and that the date code/lot code is not later than the last production date. For Qualified Parts List (QPL) items, verify the manufacturer identified on the package was a QPL source for the time period represented by the part date code/lot code.	Three (3) parts from each date code/lot code. 1/
External Visual Inspection (N/A for bare die)	IDEA-STD-1010 Acceptability of Electronic Components Distributed in the Open Market: Twenty times (20 X) magnification minimum; fifty times (50 X), or greater may be used to detect counterfeiting. SAE AS6171/2, “Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods”. 5/	One hundred percent (100%)
Mechanical Inspection (N/A for bare die)	IDEA STD-1010 Acceptability of Electronic Components Distributed in the Open Market, paragraph 10.3.3 Mechanical Inspection. SAE AS6171/2, “Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods”. 5/	Twenty (20) parts from each date code/lot code.
Marking Permanency (N/A for bare die) See 2/	Using the following in the order specified: 1) Three (3) parts Mineral Spirits, one (1) part Isopropyl Alcohol mixture; IDEA-STD-1010 10.3.2, test temperature=25C	Three (3) parts from each date code/lot code. 1/

	2) Acetone. IDEA-STD-1010 10.3.2.2, test temperature=25C SAE AS6171/2, “Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods”. 5/	
Blacktop Testing (N/A for bare die) See 2/	1) One (1)-Methyl, two (2)- Pyrrolidone IDEA-STD-1010 11.6, test temperature=125C; 2) Dynasolve seven hundred, fifty (750) solution;IIDEA-STD-1010 11.6 , test temperature=105C 3) Scrape Test (IDEA 1010 3.2.3) SAE AS6171/2, “Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods. 5/	Three (3) parts from each date code/lot code.
Delid/Decapsulation (for bare die see 3/)	Component Decap (cavity devices only) and die photograph to compare die markings to external part markings, OCM/OEM die maps, Manufacturer Data Sheet (MDS), or Known Good Die (KGD), if available. IDEA-STD-1010 11.7 SAE AS6171/4, “Techniques for Suspect/Counterfeit EEE Parts Detection by Delid/Decapsulation Physical Analysis Test Methods”. 5/	Three (3) parts from each date code/lot code. 1/
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.	Three (3) parts from each date code/lot code, all device leads (may be performed on the Delid/Decapsulation sample). 1/
Solderability (N/A for bare die)	Per IPC/EIA-J-STD-002 Solderability Tests for Components Leads, Terminations, Lugs, Terminals, and Wires.	Three (3) parts from each date code/lot code. 1/
X-Ray Fluorescence (N/A for bare die)	Termination finish composition. IDEA-STD-1010 11.3 SAE AS6171/3, “Techniques for Suspect/Counterfeit EEE Parts Detection by X-ray Fluorescence Test Methods”.	Three (3) parts from each date code/lot code. 1/

	5/	
Electrical (for bare die see 4/)	Test in accordance with Appendix A herein. See Appendix A for data requirements SAE AS6171/7, “Techniques for Suspect/Counterfeit EEE Parts Detection by Electrical Test Methods”. 5/	Only if specifically specified on PO. See PO for sample size if required.
Radiographic Inspection (N/A for bare die)	Radiographic Inspection of the die and internal construction of the product SAE AS6171/5, “Techniques for Suspect/Counterfeit EEE Parts Detection by Radiological Test Methods”. 5/	One hundred percent (100%)

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 OCM/OEM die maps, datasheet, or Known Good Die (KGD), 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 KGD 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 KGD, if available).
4. For bare die a ten (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.
5. Certification to the AS6171 main document and the slash sheet that corresponds to the test method will be required in order to perform the analysis.

5 Packaging

The packaging of shall prevent mechanical damage to the device during shipping and handling and the packaging material shall not be detrimental to the device. In addition, all parts which have been determined to require electrostatic discharge protection shall be packaged appropriately (Sealed ESD protective bags, etc).

6 Notes

6.1 This SOW was developed from Raytheon Q Note GP, Revision 11 and customized for BCT.

Appendix A: 88DOC0025 Checklist

An Excel version of the 88DOC0025 Checklist is available from the BCT Buyer.



88DOC0025
Checklist.xlsx

88DOC0025 Checklist

Inspection/Test	Test House	SAE AS6171 Certified? (yes/no)	Requirement	Sample Size	Inspection Data	Pass/ Qty	Fail/Q ty
Documentation Review			Verify package materials are consistent with datasheet and documents contain no alterations. Check lot/date code against GIDEP database.		Document findings, provide photos of noted labels and bag/tag information		
Packaging Inspection			IDEA-STD-1010 Paragraph 10.1	3 Parts Per Date Code	Verify proper packaging including MSL, Provide Photographs		
			Verify that the Lot/Date Code is not later then the last production date	N/A	Date Code: _____ Lot Code: _____ Last Production Date: _____		
			Verify that the manufacturer was QPL Source for Date Code(when applicable)	N/A	Date Code: _____ QPL Date: _____		
External Visual Inspection		SAE AS6171/2, Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods:	IDEA-STD-1010 Paragraphs 10.2 and 10.3 20 X Magnification Min., 50 X or greater may be used to detect counterfeiting	100%	Provide Photographs of a sample device and of any failure(s)		
			10.2 The Initial Inspection		Provide Sample Photographs		
			10.3.1 The Visual Inspection		Provide Sample Photographs		
Mechanical Inspection		SAE AS6171/2, Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods:	IDEA-STD-1010 10.3.3	20 Parts Per Date Code	Provide dimensions tested, pass/fail results, and a copy of the referenced OEM mechanical/package drawing limits.		
Device Marking Test		SAE AS6171/2, Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods:	3 Part Mineral Spirits, 1 Part Isopropyl Alcohol, IDEA-STD-1010 10.3.2, test temperature=25C	3 Parts Per Date Code	Provide Before and After test Photographs		
Device Surface Test		SAE AS6171/2, Techniques for Suspect/Counterfeit EEE Parts Detection by External Visual Inspection, Remarking and Resurfacing, and Surface Texture Analysis Using SEM Test Methods:	Acetone IDEA-STD-1010 10.3.2.2, test temperature=25C	3 Parts Per Date Code	Provide Before and After test Photographs		
			1-Methyl 2-Pyrrolidone, IDEA-STD-1010 11.6, test temperature=125C	3 Parts Per Date Code	Provide Photographs		
			Dynasolve 750, IDEA-STD-1010 11.6 , test temperature=105C	3 Parts Per Date Code	Provide Photographs		

			Scrape Test, IDEA-STD-1010 10.3.2.3	3 Parts Per Date Code	Provide Photographs		
Delid/Decapsulation		SAE AS6171/4, Techniques for Suspect/Counterfeit EEE Parts Detection by Delid/Decapsulation Physical Analysis Test Methods:	Component Decap and die marking to external part marking, OEM/OCM die maps or datasheet or known good die, if available. IDEA-STD-1010 11.7	3 Parts Per Date Code	Verify die markings with supplier and document any processing or die anomalies. Provide Photographs		
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 Per Date Code	May be performed on Delid/Decapsulation sample Provide photographs		
Solderability			Per IPC/EIA-J-STD-002	3 Parts Per Date Code	Provide Photographs		
X-Ray Fluorescence		SAE AS6171/3, Techniques for Suspect/Counterfeit EEE Parts Detection by X-ray Fluorescence Test Methods:	Lead finish Composition, IDEA-STD-1010 11.3	3 Parts Per Date Code	Composition: _____, provide spectrum, material composition percentages, and add comparitive analysis to Supplier's materials declaration.		
Electrical **Only if specifically specified on PO. See PO for sample size if required.**		SAE AS6171/7, Techniques for Suspect/Counterfeit EEE Parts Detection by Electrical Test Methods:	DC, Functional, Switching at 25 ° C. as specified in the Technical Data Package, MIL slash sheet or Manufacturer's Data Sheet as applicable, or other tests required by the purchase order	See PO	List each parameter tested: _____ _____ _____ _____ _____ _____		
			Supply variables data for 5 parts per Date Code	See PO			
			Supply summary of variables data	See PO	Provide a summary of all variables data for all devices tested to include: Minimum Limt, Minimum data, Average data, Maximum data, and Maximum limit, summary should include failing device data and a copy of the referenced OEM datasheet used		
Radiographic Inspection		SAE AS6171/5, Techniques for Suspect/Counterfeit EEE Parts Detection by Radiological Test Methods:	Radiographic inspection of the die and internal construction of the product, IDEA-STD-1010 11.4	100%	Provide representative x-ray images		

Appendix B: Certificate of Test Completion (COTC)

Quality Note Q11 **COUNTERFEIT ELECTRONIC PART RISK MITIGATION** **Certificate of Test Completion (COTC)** **COTC Number:**
Completed form shall be maintained as part of the quality records associated with this order
Per the requirements of Blue Canyon Technologies (BCT) Quality Note Q11, seller is authorized to ship the part number from the specified OEM and date code(s) listed below
Part Number/Revision:
Date or Lot Code(s):
Quantity:
Serial Numbers (when applicable):
OEM:
P.O. Number:
Seller:
NCR Number:
Approvals
☐ BCT Parts Engineering Review Complete By:: Date
A Copy of the COTC Shall be Sent with Each Shipment to BCT Seller provided test results for the items identified on this form have been reviewed and determined to be compliant to the requirements of the purchase order listed above. Signature of the BCT Quality Engineer on this form provides authorization for the Seller to ship the identified items.
Quality Engineer: **Date**
Name (type or print):
Comments: