



## GE Aviation Joint Affiliates Supplier Quality Specification for Electronic Component and Assembly Control

Specification Number: S-SPEC-105

aeDMS #: S-553

Issue Date: Apr 3, 2020

*This specification is in addition to and in no way limiting, superseding, or abrogating any contractual obligation as required by the applicable procurement document.*

### Table of contents

Paragraph	Title
A	Introduction
B	Electronic components management
C	Obsolescence
D	Lead free controls
E	Counterfeit mitigation
F	Prime supplier responsibility
G	Definitions

Appendix	Title
A	Tables and lists

### Applicability

This specification applies to suppliers of the following GE Aviation Joint Affiliate entities:

- GE Aviation Systems LLC
- GE Aviation Systems Ltd
- Unison Engine Components Inc
- Unison Engine Components Ltd
- Unison Industries, LLC

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## A. Introduction

This document supplements S-1005, “GE Aviation Joint Affiliates supplier quality system requirements” to include additional quality requirements for electronics value stream suppliers based on customer and industry trends. S-553 applies when referenced in the GE Aviation Joint Affiliates (GE-AJA) procurement document. Table 1 shows the applicable portions of this document for various supplier types. The supplier may be re-classified by GE-AJA based on the type of product purchased.

GE-AJA may audit suppliers regarding compliance with this document at any time.

### 1. Related documents

The following documents form a part of this document to the extent specified herein. The latest revisions apply.

#### Society of Automotive Engineers/aerospace/industry standards

SAE GEIA-STD-0005-1	Performance standard for aerospace and high performance electronic systems containing lead-free solder
SAE GEIA-STD-0005-2	Standard for mitigating the effects of tin whiskers in aerospace and high performance electronic systems
IEC 62239-1	Process management for avionics - management plan - part 1: preparation and maintenance of an electronic components management plan
IEC 62402	Obsolescence management – application guide
SAE AS5553	Counterfeit electronic parts; avoidance, detection, mitigation, and disposition
SAE AS6081	Fraudulent/counterfeit electronic parts: Avoidance, detection, mitigation, and disposition – Distributors
SAE AS6174	Counterfeit Materiel; Assuring Acquisition of authentic and Conforming Materiel
SAE AS6496	Fraudulent/counterfeit electronic parts: Avoidance, detection mitigation, and disposition – Authorized/franchised distribution
SAE AS9100	Quality Management Systems–Requirements for Aviation, Space and Defense organizations
SAE AS9120	Quality Management Systems – Aerospace Requirements for Stockist Distributors.
SAE STD-0016	Standard for preparing a DMSMS Management Plan



GE-AJA

S-1005

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**B. Electronic components management**

The electronic components management plan ensures electronic components meet performance requirements. List 2 provides example component types covered by the electronic components management plan. The supplier shall have an electronic components management plan procedure in accordance with IEC 62239-1.

**C. Obsolescence**

**1. Obsolescence management plan**

The supplier shall implement and follow an obsolescence management plan in accordance with IEC 62402 or SAE STD-0016.

**2. Obsolescence reviews**

Components procured for GE-AJA electronic assemblies shall be reviewed annually (at minimum) for obsolescence risks—the supplier shall maintain evidence of the review. The component lifecycle status must be updated in the resource planning system and, if applicable, the electronic components management plan database. Relevant obsolescence stakeholders shall provide GE-AJA with advanced notification of risks and issues affecting GE-AJA shipments, including original component manufacturer last time buy notifications and product change notices.

**3. Production phase**

a. Obsolescence awareness

If the supplier cannot proactively evaluate components for obsolescence, the supplier shall use external organizations to help forecast obsolescence. Examples include commercial obsolescence data services, manufacturer and supplier last time buy notifications, government and industry associations (i.e., GIDEP), Information Handling Services Inc. (IHS), and external research.

b. Responding to obsolescence problems

Obsolescence shall be managed by a combination of one or more of the following:

- Manufacturer change
- Last time or bridge buy
- After-market supplier
- Repackaging
- Emulation



- Component substitution
- Full or partial redesign

*i. Last time buy*

When a last time buy is employed, procedure shall control the storage of the components. GE-AJA shall be notified within 30-days of executing a last time buy.

GE-AJA funded last time buy components shall be allocated to the GE-AJA assemblies for which GE-AJA purchased the stock.

*ii. Bridge buy*

When a component availability gap has been identified, a bridge buy can sustain production and maintenance. However, a plan for solving the problem by other means must be developed and executed. GE-AJA funded bridge buys shall be allocated to the GE-AJA assemblies for which GE-AJA purchased the stock.

*iii. Redesign*

When a custom designed part or assembly must be redesigned due to obsolescence, the redesigned part shall be as functionally and physically equivalent to the original part as possible. Redesigned product shall be re-qualified by the supplier and approved by GE-AJA.

Upon request, the prime GE-AJA supplier shall assist GE in demonstrating the interchangeability of modified assemblies/parts/components and qualifying the new design.

*iv. Component substitution*

Substitution of an alternate active component shall be approved through the supplier's ECMP and compliant with IEC 62239-1 with notification to GE-AJA for final approval.

**4. End of life**

When either an obsolete assembly or component cannot be procured, or discontinued support is identified, the supplier shall notify GE-AJA Sourcing at minimum six months in advance or as soon as possible.

**D. Lead free controls**

Each supplier using lead free solder and/or components containing lead free solder (including, but not limited to, lead-free Ball Grid Array packages and lead free termination finishes) shall have a lead free control plan in accordance with GEIA-STD-0005-1 and mitigate tin whiskers in accordance with GEIA-STD-0005-2, level 2B.



Before accepting a purchase order, suppliers of lead free parts that do not meet this lead free control plan, shall notify a GE-AJA Quality Representative and receive written/email approval prior to shipping GE-AJA orders.

#### **E. Counterfeit mitigation**

To mitigate counterfeit risk, suppliers shall utilize and maintain a counterfeit mitigation plan compliant to the applicable spec indicated below:

- Distributors: AS6496 for franchised buys/AS6081 for non-franchised buys
- Assembly manufacturers and Test house conducting component screening services: AS5553
- Test houses conducting anti-counterfeit mitigation testing: AS6174

Parts that have been returned to the authorized/franchised supply chain by a third party shall not be supplied to GE-AJA.

The supplier's counterfeit mitigation plan shall provide prompt purchaser notification of shipped suspect or known counterfeit material. Where pursuant to FAR 52.246-26, counterfeit or suspected counterfeit material must also be reported through the GIDEP system.

#### **F. Prime supplier responsibility**

In addition to complying with all requirements listed in this document, prime suppliers shall flow applicable portions of this document to sub-tier suppliers and contractors.

#### **G. Definitions**

<b>Assembly</b>	A finished product supplied from the supplier to GE-AJA, which does not meet any List 2 component types, but is comprised of List 2 component types.
<b>Authorized/franchised distributor</b>	Agent, individual, or corporate organization that is legally independent from the franchiser who agrees under contract to distribute products using the franchiser's name and sales network. Distribution activities are carried out in accordance with standards set and controlled by the franchiser. Shipments against orders placed can be dispatched either direct from the original component manufacturer (OCM) or the franchised distributor or agent. In other words, the franchised distributor enters into contractual agreements with one or more electronic component manufacturers to distribute and sell said components. Distribution agreements may be stipulated according to the following criteria: geographical area, type of clientele (avionics for example), maximum manufacturing lot size. Components sourced



through this route are protected by the OCM's warranty and supplied with full traceability.

**COTS assembly**

One or more pieces, mechanical or electrical, developed for multiple commercial consumers, whose design and/or configuration is controlled by the supplier's specification or industry standard. They can include electronic components, subassemblies or top-level assemblies. COTS assemblies include circuit card assemblies, power supplies, hard drives and memory modules. Top-level COTS assemblies include a fully integrated rack of equipment such as raid arrays, file servers to individual switches, routers, personal computers or similar equipment.

**Certification**

Indicates assessment and compliance to an applicable third-party standard and maintenance of a certificate and registration [i.e. CECC, JAN, IECQ, and BSI].

**Component/part**

Electrical or electronic device that is not subject to disassembly without destruction or impairment of design use and is a small circuit having a high equivalent circuit element density which is considered as a single part composed of interconnected elements on or within a single substrate to perform an electronic circuit function. This excludes printed wiring boards / printed circuit boards, circuit card assemblies and modules composed exclusively of discrete electronic components. List 2 contains component types.

**Counterfeit**

1. An unauthorised (a) copy, (b) imitation, (c) substitute or (d) modified part which knowingly, recklessly or negligently misrepresented as a specific genuine item from an original component manufacturer or authorized aftermarket manufacturer; or
2. A previously used part which has been modified and is knowingly, recklessly or negligently misrepresented as new without disclosure to the customer that it has previously been used.

Note 1: This definition may differ from civil or criminal laws that address the acts of counterfeiting or fraud and is not intended to make a legal determination. Used parts sold as new that have not been modified are not counterfeit according to some civil and criminal statutes. These issues are covered under existing laws covering fraud. For civil matters, this issue would typically be covered under civil fraud and terms and conditions of a purchase order or contract that specified parts must be new.

Note 2: Parts which have been refinished , up-screened or uprated and have been identified as such are not considered counterfeit>

Note 3: Examples of a counterfeit part can include, but are not limited to:



	the false identification of grade, serial number, date code or performance characteristics.
<b>Obsolescence</b>	Parts at the end of their lifecycle, which will no longer be produced
<b>Prime supplier</b>	A direct GE-AJA supplier
<b>Test house/facility</b>	A supplier which verifies the functionality of an assembly, part, or component, and does not add or remove any components or materials.



## Appendix A. Tables and lists

**Table 1: Applicability matrix**

Supplier type	Electronic components management	Obsolescence	Lead free controls	Counterfeit mitigation
<b>Manufacturers of</b>				
Custom/supplier-designed assemblies	X	X	X	X
GE designed assemblies	Non-applicable (n/a)	X	X	X
COTS assemblies	X	C.2, C.3, and C.4 only	X	X
Original components	n/a	C.2, C.3, and C.4 only	n/a	n/a
<b>Distributors</b>	n/a	C.2, C.3, and C.4 only	n/a	X
<b>Test houses/facilities</b>	n/a	n/a	n/a	X

**List 2: Electronics components management plan component types**

Antennas	Fuses/breakers	Power supplies/power modules
Batteries	Gages	Processors
Cables	Heaters	Relays & contactors
Capacitors	Instrumentation	Resistors
Circuits	Keypads	Rotors
Coils and chokes	LCDs	Solar cells
Connectors	Lamps	Signal devices
Cores	Memories	Switches
Diodes	Meters & Indicators	Transducers
Displays	Microelectronics	Transformers
Fans/blowers	Motors	Transistors
Fiber optics	Oscillators	Transmitters
Ferrite Beads	RF/microwave components	Timing devices
Filters	PWBs	Wires