



# **Electronic Parts Management for Space**

**Leading global supplier of electrical, electronic,  
and electromechanical (EEE) parts and services**



**[www.Comtechspace.com](http://www.Comtechspace.com)**

## The Electronic Components Group

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Comtech's Electronic Components Group (ECG), based in California, is a leading global value-added supplier for high-reliability electrical, electronic, and electromechanical (EEE) parts and services to spacecraft and launch vehicle manufacturers and their subcontractors. Unlike traditional suppliers, Comtech has the unique ability of not only providing high-reliability parts but coupling that with our engineering expertise to solve complex procurement problems. Part of an AS9100C / ISO 9001:2008 certified company, the ECG group specializes in component engineering, procurement and quality assurance services for electronic components used in space and military applications worldwide.

**Comprehensive Parts Management:** Providing solutions for a single line item, an entire project parts list, or a consolidated parts list across multiple programs and users. We are the most experienced and trusted provider of parts management services for high reliability programs, worldwide.

**High Reliability Parts Procurement:** Cost-effective and efficient delivery of products to meet stringent customer expectations and requirements, on schedule.

**Engineering Services:** Support during the preliminary design phase and extending through mission or project completion.

## Procurement & Component Engineering

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Comtech Space & Component Technology can simplify your supply chain by managing all aspects of parts procurement, parts selection, component engineering and quality assurance. Our long-standing supplier relationships and experience working with manufacturers to resolve manufacturer test and quality problems is unparalleled in this industry.

We work with our customers to develop test plans in accordance with your specific program requirements. Testing can consist of:

- Electrical, environmental, and other test services
- Testing for space, MIL, and industrial level qualification
- Upscreening, special testing, Quality Conformance Inspection (QCI) performed regularly on a wide variety of parts
- Complete die lot qualification
- Total ionizing dose and single event effects

## Prohibited Materials Analysis

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Comtech Space & Component Technology conducts in-house **x-ray fluorescence (XRF)** analysis to ensure that all high-reliability space components do not contain prohibited materials, such as cadmium, zinc, and pure tin, which reduce device life or cause latent failures, intermittent failures, or total system failure.

- Pure tin analysis performed in accordance with MIL-STD-1580 requirements, JEDEC JESD213, or specific customer requirements
- Fischer system with silicon drift detector has a resolution of 150 eV, far exceeding the MIL-STD-1580 requirement maximum of 290 eV
- Calibrated with a 97Sn/3Pb standard procured directly from the National Institute of Standards and Technology
- Nondestructive identification of surface finishes, underplate materials, and base metals
- Scanning electron microscopy with energy-dispersive spectroscopy (SEM-EDS) available as referee when needed

## Failure Analysis

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When a failure happens during production, you need to determine the root cause, and not just fix the symptom. Comtech engineers have the experience with failure analysis methodology and techniques to answer these two key questions:

1. What happened?
2. What do we do about it?

We understand which techniques are appropriate and, at what time in the investigation, to lead to a root cause and corrective action. Our engineers have decades of space component engineering experience along with a vast network of internal and external laboratory capabilities:

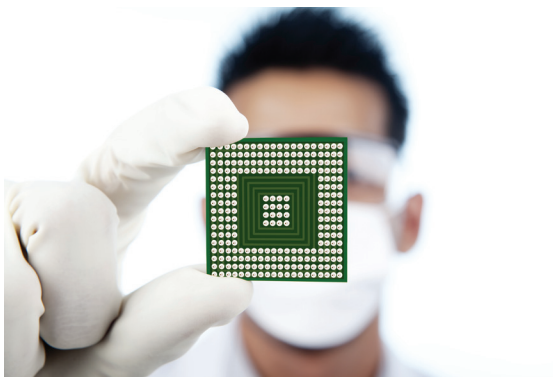
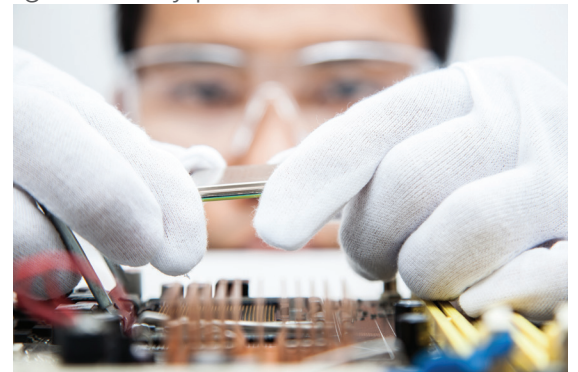
- History with all high-reliability EEE component types
- Knowledgeable selection of the appropriate failure analysis tools
- One-stop service incorporating quick access to specialized labs throughout the U.S



## Custom Specifications & Manufacturing

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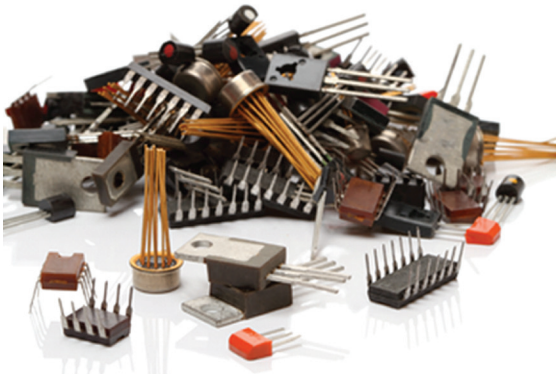
Comtech supports our customers with custom specifications for high reliability parts to insure devices meet all spacecraft and launch vehicle requirements. For over 40 years we have been working with our customers to create upsampling, source control drawings, and other specifications for high reliability applications. We work with our customers to develop a specification and packaging solution that meets their needs for reliability, performance, and budget.



Comtech also helps our customers with die packaging, hybrid development, integrated package screening and lot qualification to meet program requirements. Our engineers have an extensive knowledge of industry standards and specifications such as DLA, NASA, GSFC, MSFC, ESCC, and others.

## Obsolete Parts & Packaging

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In a world where it is critical to ensure high reliability parts will continue to be manufactured through the life cycle of launch vehicle and spacecraft programs, Comtech's obsolescence and life cycle management programs ensure design repeatability and follow-on program success.

We provide the expertise to eliminate or minimize the impact of obsolescence on your design. We will review your parts list and provide options for your consideration:

- Determine end-of-life (EOL) status
- Review manufacturers
- Locate alternate devices and/or manufacturers
- Provide test regimes to assure compliance to program requirements

## Counterfeit Parts Detection

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Do you know where your parts came from? With our counterfeit parts detection procedures, we will ensure that the high-reliability parts we deliver are genuine. Comtech inspectors trained to IDEA-STD-1010-B and certified to IDEA-ICE-3000 can perform the analysis appropriate for a given lot of parts, depending on risk factors such as source and provenance.

- Visual inspection
- X-ray (see if samples match internally or even have a die)
- X-ray fluorescence (XRF)
- C-mode scanning acoustic microscopy (C-SAM)
- Electrical testing: Continuity, functional, DC, AC, block testing
- Destructive physical analysis to the die level, to check mask identifiers
- Basic inspection and lot homogeneity inspection
- Fourier-transform infrared spectrometry (FTIR)
- Cross-sectioning
- Other nondestructive options



Official member of Electronic Retailers Association, Inc. for Counterfeit Prevention

## Radiation Components & Engineering

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Comtech supplies hermetically packaged radiation tolerant memory devices to the space and military communities. Our radiation test database contains over 1000 radiation reports. We also have access to radiation test reports from JPL, GSFC, NASA, NGST, Aerospace Corp, Sandia and many manufacturer databases.

## Radiation Analysis & Screening

In the early design phases of a program, we assist our customers with mission radiation studies, derating requirements, and recommendations for parts and materials. We work with our customers to achieve a program that meets their needs for reliability, performance, and budget. As the detail design progresses, Comtech Space & Component Technology makes specific recommendations for part, material, and process changes. We work with a network of well established test labs to meet customer requirements.


### **Test capabilities include:**

- Total Ionizing Dose (TID)
- Enhanced Low Dose Rate Sensitivity (ELDRS)
- Displacement Damage
- Flash X-Ray
- Electro magnetic pulse (EMP)
- SEE-Single Event Effects
- Heavy Ion testing
- Proton, neutron testing, and gamma testing

## Customer Source Inspection

Comtech assists our customers with precap inspection, in process inspection and final source inspection. These inspections are conducted by trained engineering specialists at the manufacturer's facility. Our inspectors perform data review to insure the testing is following the required parameters and temperatures in the specification. We have extensive experience with high-reliability manufacturing and testing.

- Extensive knowledge of industry standards and specifications such as DLA, NASA, GSFC, MSFC, ESCC and others
- Construction analysis
- Cost and schedule estimates
- Rates available for trained technicians and for experienced engineers, depending on your needs




**QFR**  
**QUALITY FIELD REPORT**

No. \_\_\_\_\_  
 CONTINUATION SHEET A  
 Page \_\_\_\_\_ of \_\_\_\_\_

Project \_\_\_\_\_

REMARKS: Information relevant to this inspection:

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**QFR**  
**Quality Field Report**

No. **V 07151**  
 Page 1 of \_\_\_\_\_

Manufacturer's Name & Address \_\_\_\_\_ Area Code \_\_\_\_\_ Person Contacted \_\_\_\_\_ Buyer's Name \_\_\_\_\_

Phone No. \_\_\_\_\_ Purchase Order No. \_\_\_\_\_ C/N \_\_\_\_\_

Item P.O. Item	Part Name & Number	LTN	Revisions	PPMO	Lot Date Code	Jct Ident.	Lot Qty	Qty Insp	Qty Acc	Qty Req
A										
B										
C										
D										
E										
F										
G										

Round Pull Test Data (if applicable) Attached

Die Shear Test Data (if applicable) Attached

Screening Device Micro Data (if applicable) Attached

REMARKS: Information relevant to this inspection:

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Quality Field Engineer \_\_\_\_\_

Stamp \_\_\_\_\_

Badge \_\_\_\_\_

Final Shipment  Yes  No

2865B Rev. 6/17 White - Procurement Quality Supplier File Canary - Supplier

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### About Comtech

Comtech Telecommunications Corp. (Nasdaq: CMTL) designs, develops, produces and markets innovative products, systems and services for advanced communications solutions. The Company sells products to a diverse customer base in the global commercial and government communications markets. For more information visit [www.comtechtel.com](http://www.comtechtel.com).

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