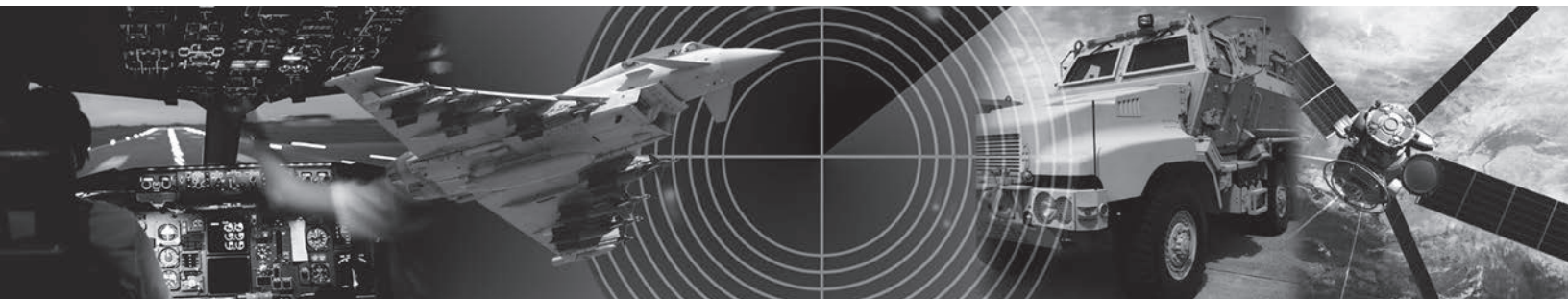


# Products for Harsh Environments

High Reliability Analog ICs



Power Regulation & Management

Signal Conditioning

Data Acquisition








Interface

RF & Wireless

Wireless Sensor Networks

$\mu$ Module<sup>®</sup> Solutions

# Special Product Grades

|   | Product Grade       | Quality Level                               | Packaging               | Usage                                |
|---|---------------------|---|-------------------------|--------------------------------------|
|  | Radiation Hardened  | MIL-PRF-38535 Class V or LTC Equivalent SCD | Hermetic SnPb           | Space Missions                       |
|  | Joint Army Navy     | MIL-M-38510 Class Level S                   | Hermetic SnPb           | Support for Legacy Space Systems     |
|  | Military            | Military-Temp/ MIL-STD-883/SMD              | Hermetic SnPb           | Support for Legacy Military Systems  |
|  | Military Plastic    | Enhanced Testing, Screening and Inspection  | Plastic Pb Free or SnPb | COTS for Harsh Military Applications |
|  | High Temperature    | Optional Automotive Screening Flow          | Plastic Pb Free or SnPb | Upgrade from Industrial Flow         |
|  | Extreme Temperature | 100% Electrical Test at 200°C               | Hermetic Pb Free        | Oil & Gas Applications               |
|  | Dice                | Commercial, MILDICE, RHDICE                 | Unpackaged              | Hybrid and MCMs                      |

Linear Technology has supplied high performance analog integrated circuits to the aerospace and defense industry for over 30 years and continues to dedicate resources to support the specialized needs of the market. This ongoing commitment is underpinned by exceptional long-term support of legacy products and industry leading quality and reliability.

## Quality Certifications

- MIL-PRF-38535 Class Q and V
- JAN Microcircuit Certification (QPL) Class S and B
- TS16949 Certification
- ISO 9001 and ISO 14001 Certification
- Stack International Certification
- PURE (Plastic Used in Rugged Environments) Council Certification

| ACCELERATED HIGH TEMPERATURE OPERATING LIFE (HTOL) TEST RESULTS   |                |
|---|----------------|
| <b>FIT Rate</b>   | <b>0.08</b>    |
| Number of Total Failures  | 5              |
| Total HTOL Sample Size from Q1 2004 to Q2 2012  | 153,977        |
| Equivalent Device Hours at 55°C   | 76,896,663,593 |
| (1) Assumes Activation Energy = 1.0 Electron Volts<br>(2) Failure Rate Equivalent to 55°C, 60% Confidence Level<br>(3) 1 FIT = 1 Failure in One Billion Hours<br>Note: FIT rate calculation based on JEDEC Standard JESD 85 |                |

## Over Ten Years of Mil-Aero Quality Awards

**2003, 2005**

Rockwell Collins Top Preferred Supplier Award

**2005**

Stack International Certified

**2005, 2006, 2007, 2008**

Northrup Grumman Space Technologies Supplier Award – Gold Level

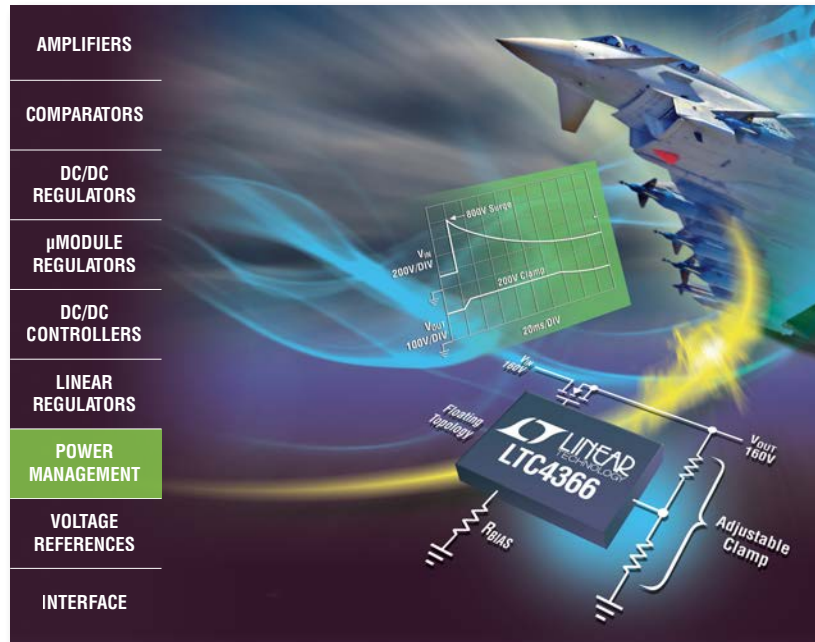
**2009**

The Boeing Company Performance Excellence Award – Gold Level

**2009**

Rockwell Collins Supplier of the Year Award for Standard Semiconductor

# Military Plastic Products



Linear Technology's military plastic (MP) grade products provide a COTS (commercial off-the-shelf) solution with guaranteed performance over extended operating temperatures for use in applications subject to very harsh environmental conditions.

| Grade     | 25°C Test   | Maximum Temperature Test                              | Minimum Temperature Test                         |
|-----------|-------------|---|--|
| C         | 100%        | 70°C Sample Test, S/S 125 to 315/0 <sup>(1)</sup>     | 0°C Sample Test, S/S 125 to 315/0 <sup>(1)</sup> |
| E         | 100%        | 85°C Sample Test, S/S 125 to 315/0 <sup>(1)</sup>     | 0°C Sample Test, S/S 125 to 315/0 <sup>(1)</sup> |
| I         | 100%        | 85°C to 125°C Sample Test <sup>(2)</sup> , S/S 1000/0 | -40°C Sample Test, S/S 1000/0                    |
| H         | 100%        | 100% Test at 125°C or 150°C <sup>(2)</sup>            | -40°C Sample Test, S/S 1000/0                    |
| <b>MP</b> | <b>100%</b> | <b>100% Test at 125°C or 150°C <sup>(2)</sup></b>     | <b>100% Test at -55°C</b>                        |

S/S = Sample Size (315/0 = Sample of 315, pass on 0 rejects) (1) Sample size depends on lot size (2) Test temperature defined on data sheet

## MP-Grade Enhancements

- Additional Inspection Operations
- Tighter In-Process Controls
- Temperature Cycling to Remove Infant Mortality Failures
- 100% Electrical Testing to Guarantee Data Sheet Performance
- Enhanced Reliability Monitoring Program
- Fully Characterized Over the Military Temperature Range

## Standard Features for All Product Grades

- Extensive Qualification Exceeding the Requirements of AEC-Q100
- Tin-Lead or Lead-Free Finish
- Full Assembly and Fab Lot Traceability Using Device Trace Code or Paperwork
- One Standard Baseline Manufacturing Flow for Each Device Type

2010

The Boeing Company  
Performance Excellence  
Award – Silver Level

2010

Stack International  
Semiconductor Supplier  
Award – Bronze Level

2011

The Boeing Company  
Performance Excellence  
Award – Silver Level

2012

Stack International  
StackTrak Supplier  
Recertification

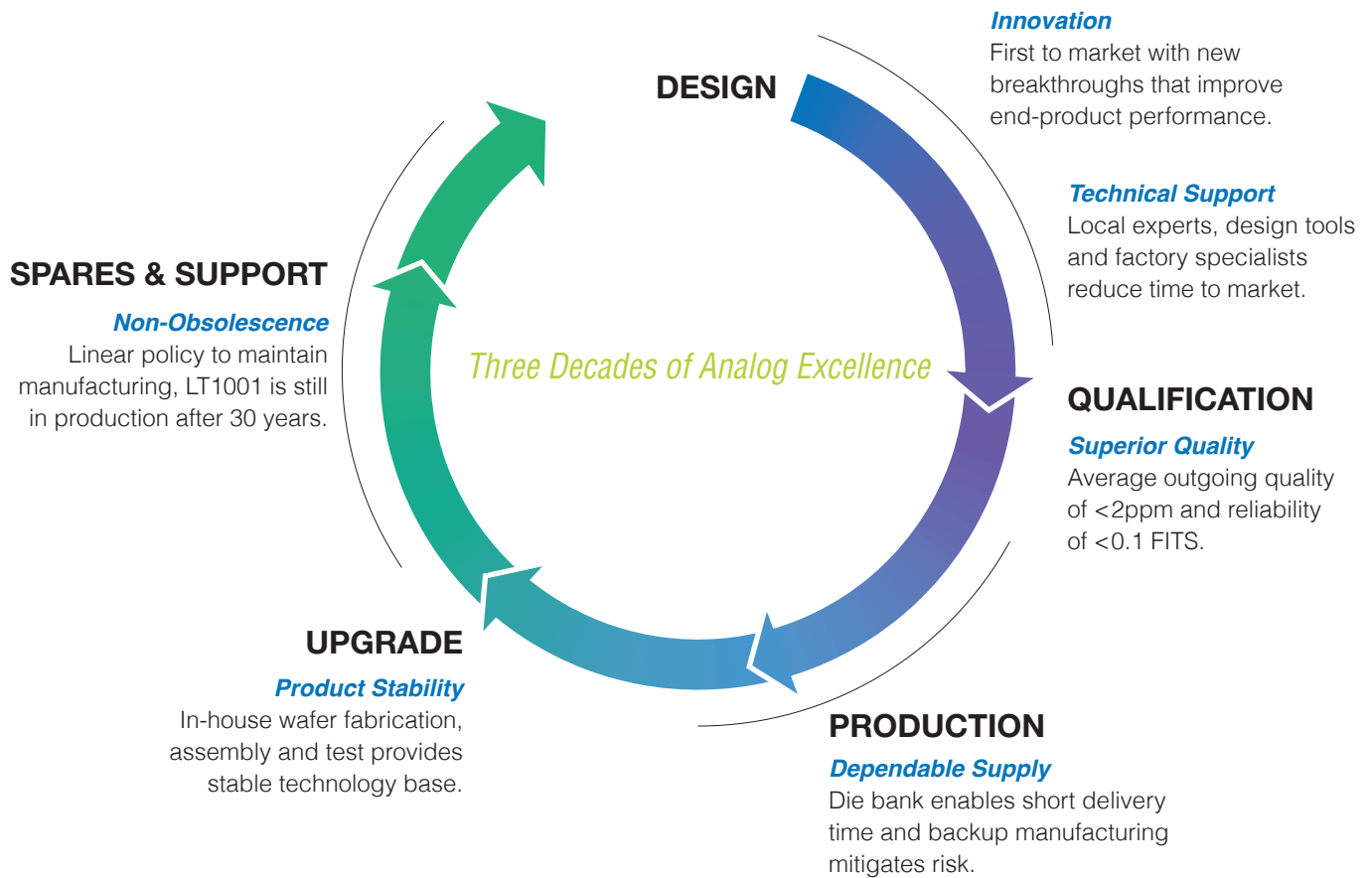
2013

The Boeing Center  
Supplier of the Year  
Award

2014

The Boeing Center  
Supplier of the Year  
Award

# Mil-Aero Life Cycle Support



## Linear Technology Commitment

- Non-Obsolescence Policy
- Innovative Products in Special Product Grades
- Lifetime Warranty on All Integrated Circuits
- Continued Availability of SnPb Terminal Finish

For more information and complete product listing, please visit: [www.linear.com/space](http://www.linear.com/space)



[www.linear.com/space](http://www.linear.com/space) ▪ 1-800-4-LINEAR

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