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## **SECTION 12—MILITARY PRODUCTS**

# Datasheet.Live

**SECTION 12—MILITARY PRODUCTS**

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**NOTE**

Military product data sheets are available from your local LTC Sales Representative, or by calling the LTC Literature line at 1-800-4-LINEAR.

## LINEAR TECHNOLOGY MILITARY PRODUCTS/ PROGRAMS

Linear Technology Corporation (LTC) offers a comprehensive range of high performance analog/linear integrated circuits including; Data Converters, Interface devices, High Speed Amplifiers, Precision Operational Amplifiers, Comparators, Voltage References, DC-DC Converters, Switches, Voltage Regulators, Switching Regulators, PWMs, Switched Capacitor Filters and other special function products serving the rigorous demands of the military marketplace.

The Company's specification system, quality procedures and policies were set up from the beginning to meet the exacting demands of MIL-Q-9858 (Quality Program Requirements), MIL-I-45208 (Inspection System Requirements), MIL-PRF-38535 (General Specification for Microcircuits), MIL-STD-976 (Certification Requirements for Microcircuits), MIL-STD-883 (Test Methods and Procedures for Microelectronics) and more recently the ISO 9000 (Internal Standards for Quality Management).

In addition, the Company has introduced a line of radiation tolerant devices which are offered with two different in-house levels of enhanced reliability processing to serve ground, air and/or space applications, including customer generated Source Controlled Drawings (SCDs) for a variety of missions.

Some of these specifications are no longer active, however the standards set in the early days of the military business are still met or exceeded by Linear Technology today.

LTC's military programs include:

- JAN Class S
- JAN Class B
- Standard Microcircuit Drawings (SMDs)
- 883
- Hi-Rel (SCDs)
- LTC "RH", Class "S" devices processed using proprietary radiation hardening

### LTC JAN

At the end of 1969, the Solid State Applications Branch of the Rome Air Development Center (RADC) issued the first copy of MIL-M-38510. This general specification for microcircuits established the procedures that a manufacturer must follow to have products listed on the Qualified Parts List (QPL).

One major problem faced by defense contractors using semiconductor devices was the inability to interchange devices caused by a proliferation of non-standard electrical specifications. The 38510 (JAN) program addressed this problem by publishing detailed electrical specifications (slash sheets) for each component to be listed on the QPL.

Class S JAN devices are completely processed in the United States and all wafer fabrication, wafer sort, assembly, testing, and conformance testing are performed on-shore. Class B JAN may be assembled and/or tested offshore by qualified subcontractors or other Linear Technology divisions.

In August 1984, LTC was visited by a team of Defense Electronics Supply Center (DESC) personnel. This team spent almost four days auditing LTC and at the end of the visit they awarded the Company "Class B Line Certification." *This was a first for any company to receive this distinction on their first audit!*

In early 1985, LTC joined the ranks of the eighteen existing QPL suppliers. Of these eighteen, only a handful of suppliers participate in the linear military JAN market. LTC believes its analog design experience and manufacturing strength has and will continue to make significant contributions to this market.

LTC's first QPL listing was achieved in February 1985, one year after the Company made JAN Class B a corporate goal. Other companies have typically taken 2 to 3 years to achieve this status. The line certification and QPL approvals

# MILITARY PRODUCTS

were awarded to MIL-M-38510 and MIL-STD-883 specifications. Since that time the Company has been re-audited to the latest revisions of these specifications and has maintained an uninterrupted certification record for the manufacture of JAN QPL products.

In November 1987, LTC was audited by a team from DESC, Naval Weapons Support Center and Aerospace Corporation and was awarded "Class S Line Certification."

LTC's policy of providing JAN linear components supports the United States Government's position of standardization to decrease the number of active part types maintained by DESC. This number is currently in excess of 85,000 for all types of components (contrasted to approximately 8,000 industry standard components). Standardization will clearly decrease costs and assist in the maintenance of military weapons systems and equipment now in the field.

LTC maintains its JAN product offerings under the current revision of MIL-PRF-38535, Appendix A. LTC now offers 45 products listed as Class B Qualified Parts and 40 products as Class S Qualified Parts on the QML products listing – QML-38535. To receive an updated copy of LTC's current JAN QPL product offering, contact your local LTC sales office or LTC Military Marketing.

For JAN Flows see Figure 1 and Figure 2.

In June 1994, LTC was granted transitional Qualified Manufacturers List (QML) certification to MIL-PRF-38535 by DESC, and will be pursuing full QML certification. A full QML Validation audit of our Milpitas facility was held in November of 1997 with representatives from DSCC (Defense Supply Center, Columbus), Navy-Crane, and Aerospace Corporation auditing our Milpitas facility. This certification as a QML (Qualified Manufacturing Line) supplier covers LTC's design centers, both onshore and offshore manufacturing and test facilities and assembly subcontractors.

## LTC Standard Military Drawings

DESC drawings were initiated in 1976 to standardize the electrical requirements for full temperature-tested military components. These DESC drawings (or minispecs) were initially issued for low power Schottky devices (54LS) used by defense subcontractors on the Air Force's F16. The program accomplished standardization of testing, without the delays associated with the qualification process for JAN components.

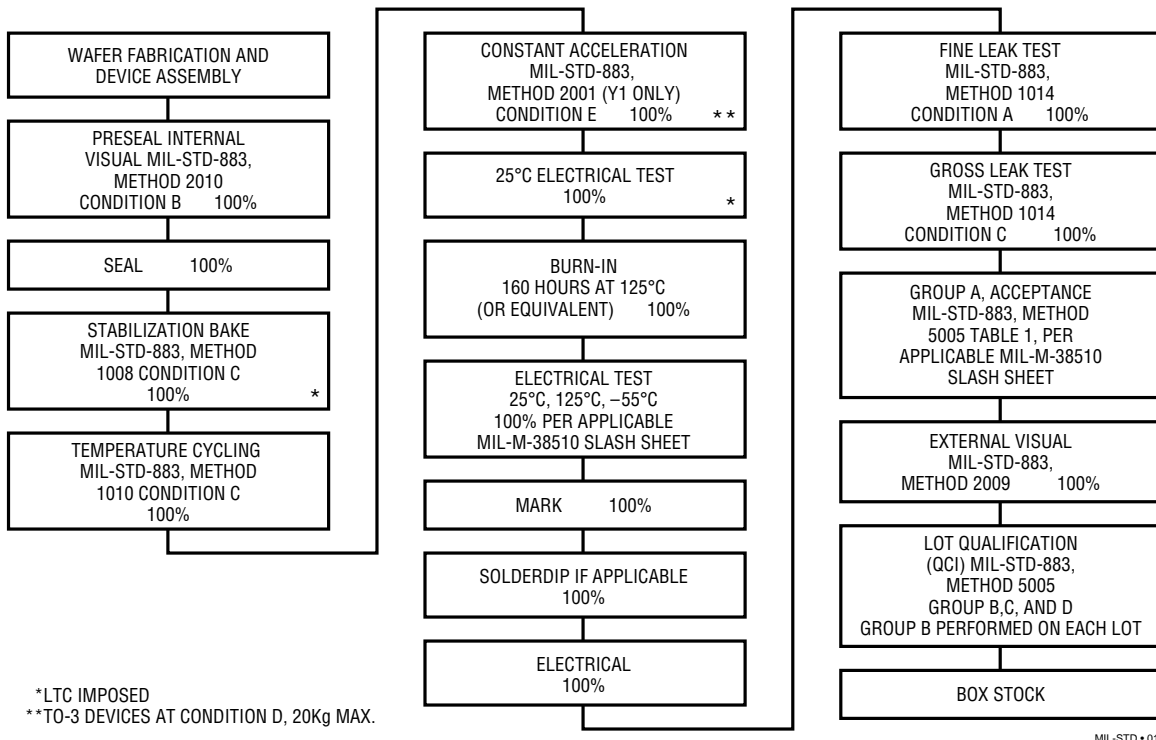
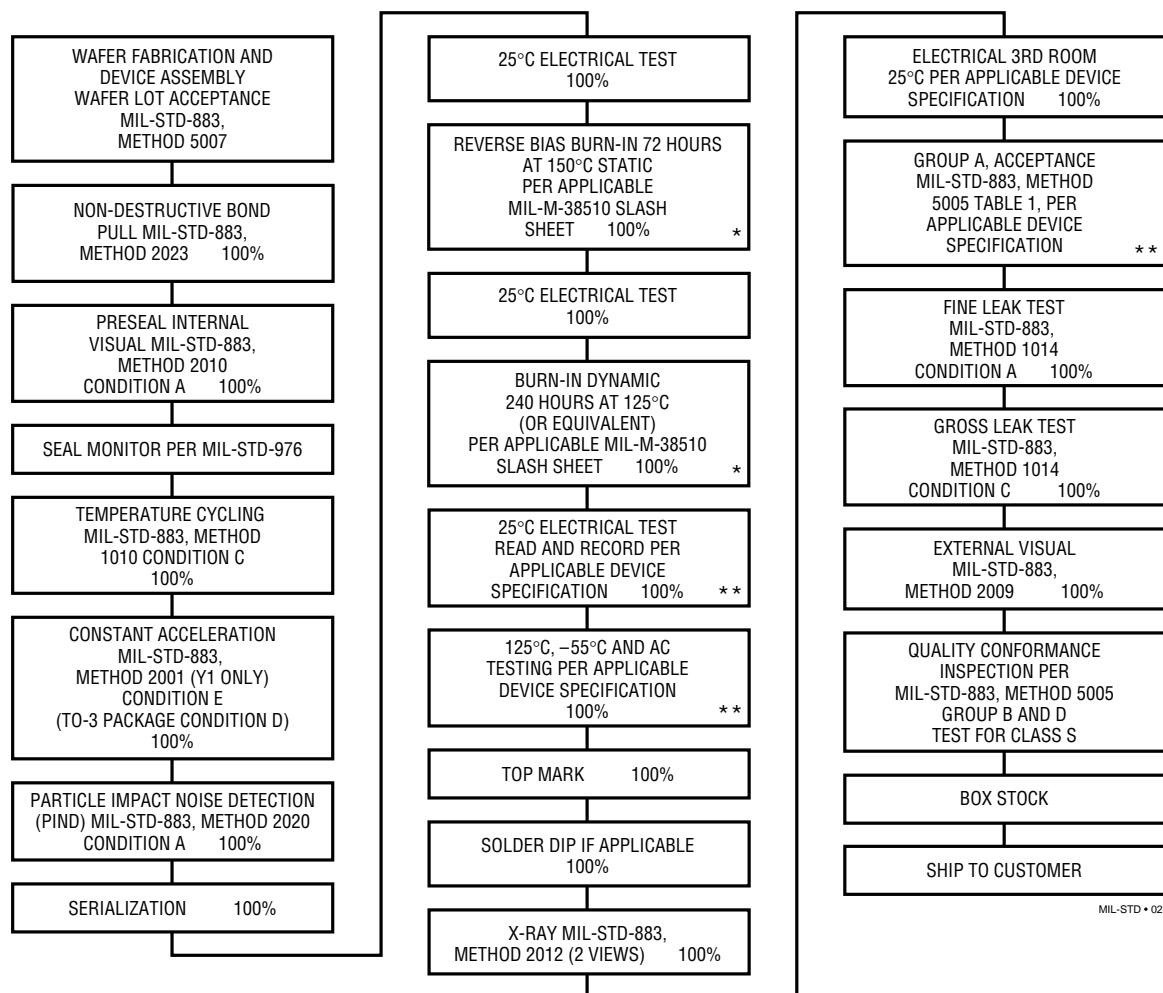


Figure 1. MIL-M-38535 Class B Flow



\* IN THE CASE WHERE THERE IS NO APPLICABLE MIL-M38510 SLASH SHEET, THE BURN-IN SCHEMATIC AS WELL AS THE APPLICABILITY OF 100% DYNAMIC BURN-IN SHALL BE NEGOTIATED BETWEEN THE CUSTOMER AND LINEAR TECHNOLOGY CORPORATION.  
 \*\* APPLICABLE DEVICE SPECIFICATION SHALL BE THE MIL-M-38535 DEVICE SPECIFICATION, OR A DEVICE SPECIFICATION AGREED UPON BETWEEN THE CUSTOMER AND LINEAR TECHNOLOGY CORPORATION.  
 NOTE: CUSTOMER SOURCE INSPECTION WILL BE ADDED AS SPECIFIED IN CUSTOMER'S PURCHASE ORDER. GOVERNMENT SOURCE INSPECTION IS BY LETTER OF DELEGATION BETWEEN CUSTOMER AND DCMC

**Figure 2. MIL-PRF-38535 Class S Flow**

The DESC drawing was viewed as a preliminary specification prior to JAN approval, and it ranks second in the order of purchasing hierarchy to JAN. This order is defined in Requirement 64 of MIL-STD-454. If a JAN part is available, it is still preferred, however, there are many types of devices where the volume is such that the cost of a full JAN qualification may not be justified, but where a need exists for electrical standardization.

CMOS and analog circuits were added to the DESC Drawing Program in 1977, 1978 and 1979, but widespread acceptance of these parts was not achieved. Today with more emphasis being placed on standardization, the interest level in DESC drawings has accelerated. This category

of product can be built offshore with 883-level processing and the electrical parameters are tested specifically to the DESC drawing.

In 1986 a new program named Standard Military Drawings (SMDs) was launched by DESC. This replaced the previous DESC Drawing Program. This new program is aimed directly at standardizing electrical requirements with the objective to decrease the time required to issue military drawings. Both DESC and the SMDs changed names in 1996 to DSCC (Defense Supply Center, Columbus) and Standard *Microcircuit* Drawings, respectively. These changes are part of the movement to streamline and

# MILITARY PRODUCTS

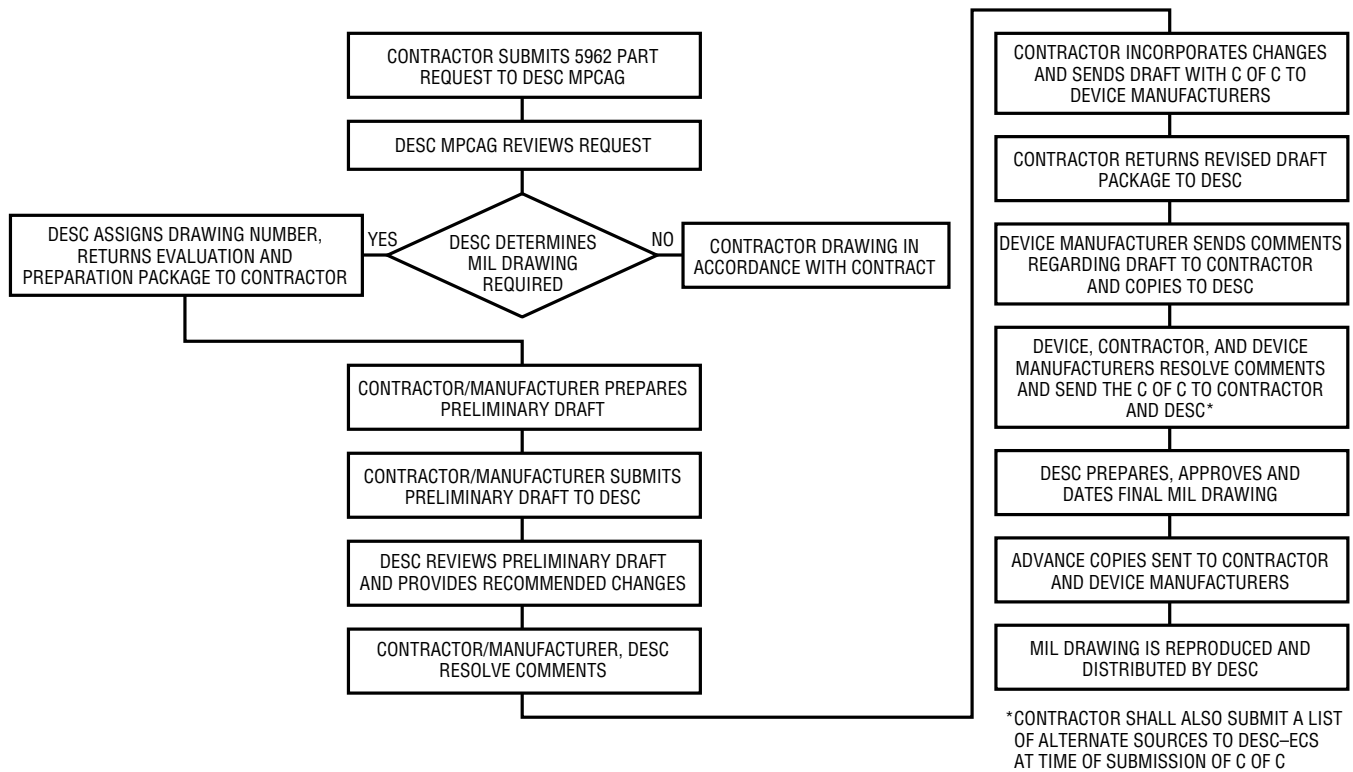


Figure 3. SMD Preparation Flowchart

combine government qualification agencies and procedures in the spirit of QML. QML (MIL-PRF-38535) sets forth the idea that we know our product and customers best and have systems in place and functional that will consistently produce reliable parts. Additionally, we will strive for continuous product and manufacturing improvements that will best serve our customers' needs, including timely delivery of quality products. To achieve real time introduction of new SMD product, we have set up a computer link with the SMD engineering group at DSCC. LTC is actively supporting the SMD program and with QML certification, LTC enters the next generation of SMDs, Class N for Non-traditional, a new category of plastic devices that will be processed with LTC's own standard plastics flow and electricals, and manufactured on lines that have proven controls and track records.

LTC has over 134 hermetic devices listed on DESC and Mil drawings, and we are actively supporting these standardization programs by having parts available off the shelf from LTC and from distribution outlets. Class N SMDs will be negotiated as needed with LTC's customers for plastic products.

For SMD Preparation Flow see Figure 3.

## SMDs Get A New Part Numbering System

The numbering system to standardize the part numbers for JAN 38510 and SMD (Standard Microcircuit Drawing) products follows.

The SMD number 5962-XXXXXZZ( )YY will be used, with a minor change for the 38535 + QML qual'd devices. This makes one part have one part number with just the grade identification being different (M = 883, B = JAN B, S = JAN S, Q = level B SMD, V = level S SMD, and N = Non-traditional (plastic)). An example of this follows:

### Old System

LTC PART NUMBER	"OLD" SMD NO.	JAN PART NUMBER
LT1021CMH-5/883	5962-8876202GA	JM38535/12407BGA

### New System

LTC PART NUMBER	"NEW" SMD ONE PART NUMBER SYSTEM
LT1021CMH-5/883	5962-8876202(M, B, S, Q, V, or N)GA

This was implemented on January 1, 1990, for all SMDs and slash sheets created after this date. Devices listed or approved in the past may retain their respective existing part numbers.

## LTC MIL-STD-883 Product

On December 31, 1984, a key clause was added to MIL-STD-883, paragraph 1.2.1. It was a way of pointing to compliant non-JAN product and require the standards of processing required in the QPL program (JAN). It made a direct link from Class M (or /883) devices to MIL-M-38510, and by that link to MIL-PRF-38535, Appendix A.

As Linear Technology moves into the QML arena, we are allowed by DSCC to look seriously at streamlining flows, eliminating non-value added testing, and doing the “best commercial practices” available in order to continuously improve our products and delivery, while reducing handling and costs. Although MIL-STD-883 stands without equal as a specification for test methods, it also locks us into compliance with Appendix A of MIL-PRF-38535 rather than the body of the specification which allows us to respond in a timely manner to technology changes and improved processes.

As data is gathered in support of these changes, it is presented to our in-house TRB (Technical Review Board) for review and approval. On QML products the top mark changes from “.../883” plus compliant “C” to marking that includes “Q” to show that the product is coming from a fully qualified QML line.

**Table 1. LTC 883 Group A Sampling Plan**

TEST	CONDITION	883	
		SAMPLE SIZE	ACCEPT
DC Parametric	$T_A = 25^{\circ}\text{C}$	116	0
DC Parametric	$T_A = -55^{\circ}\text{C}$	116	0
	$+125^{\circ}\text{C}$	116	0
AC Parametric	$T_A = 25^{\circ}\text{C}$	116	0

## LTC Hi-Rel (SCDs)

LTC recognizes the need for Source Controlled Drawings (SCDs) and the Company’s DSCC-certified line is well equipped to handle these requirements for space and

hi-rel applications. The Company has a comprehensive specification review procedure and emphasis is placed on compliance to test methods and procedures. Over 8,000 specifications have been reviewed to date with fast feedback to our customers.

LTC has serviced SCD orders including “S” level specifications with an emphasis on compliance with customer purchase order requirements and on-time delivery performance. A dedicated SL traveller is initiated to baseline the manufacturing and test flow requirements to service each order.

LTC’s Product Marketing Group can provide you with more details on a case-by-case basis.

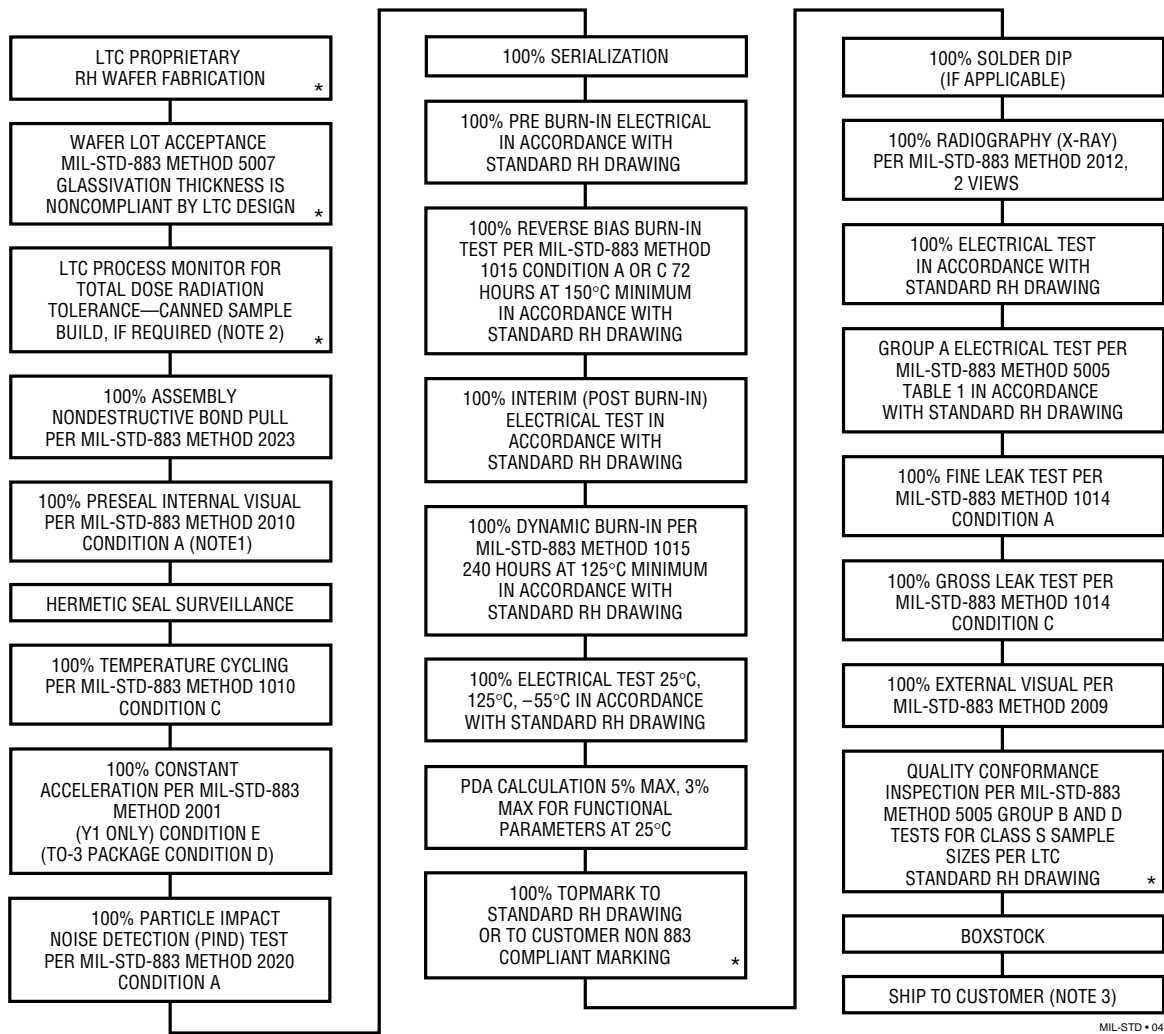
## LTC’s Radiation Hardness Program

LTC has developed a proprietary design/wafer fabrication process and has introduced a family of RAD HARD (RH prefix) products to support space level applications. The wafer lot acceptance, packaging, test, burn-in, radiation hardness testing, quality assurance and data sheet requirements are specified in a product specific LTC generic RH drawing. Each generic RH specification is complemented with product specific test travellers which detail the test, burn-in and processing requirements for each package type and electrical grade.

Each RH data sheet specifies the end point electrical test requirements for Total Dose Irradiation testing performed on a sample basis. The radiation sample is typically comprised of a minimum of two wafers per wafer run with total dose irradiation provided by a Cobalt 60 source at a dose of approximately 20 rads/sec. For guaranteed radiation levels, total dose radiation testing at an outside certified test lab is offered as an option.

Due to the unique wafer processing required to make RH products, the RH products are not totally compliant with all the Class S requirements of MIL-STD-883. Since MIL-STD-883 specifically prohibits the marking of non-compliant products with the 883 compliance (C) indicator, LTC’s RH products are marked with the LTC RH prefix part number or with a special mark specified by the customer.

# MILITARY PRODUCTS



NOTE: 1. SOURCE INSPECTION AT PRE-SEAL INTERNAL VISUAL IS STANDARD.  
 2. FOR GUARANTEED RADIATION LEVELS, OUTSIDE LAB CHARGES WILL APPLY FOR SAMPLES TO MIL-STD-883, TEST METHOD 1019, TOTAL DOSE IRRADIATION.  
 3. CUSTOMER SOURCE INSPECTION CAN BE ADDED AT FINAL SHIPMENT PER P.O.

\* DENOTES PROCESS STEPS THAT ARE NONCOMPLIANT TO THE CLASS S REQUIREMENTS OF MIL-STD-883.

Figure 4. LTC Standard “RH” Packaged Product Flowchart

## Military Market Commitment

LTC is a focused, dedicated company servicing the needs of the linear military marketplace. We are shipping to the top U.S. defense electronics contractors who have qualified

and approved our products. LTC is committed to being the best and most proficient high quality supplier of analog military components.



## 883 CERTIFICATE OF CONFORMANCE — LEVEL B

LTC Part Number \_\_\_\_\_

Lot Traceability No. \_\_\_\_\_

Purchase Order No. \_\_\_\_\_

QUALITY ASSURANCE INSPECTOR	
DATE	SIGNATURE

Customer Name \_\_\_\_\_ P/N \_\_\_\_\_ Qty \_\_\_\_\_

Date Code \_\_\_\_\_ Shipper # \_\_\_\_\_ Traveller Lot # \_\_\_\_\_

Group A = \_\_\_\_\_ Group B = \_\_\_\_\_ Group C = \_\_\_\_\_ Group D = \_\_\_\_\_

Group B/3 Re-Inspection Date, If Applicable \_\_\_\_\_

**LINEAR TECHNOLOGY CORPORATION** HEREBY DECLARES THAT THE COMPONENTS SPECIFIED ON THE ABOVE PURCHASE ORDER COMPLY WITH YOUR SPECIFICATIONS AND REQUIREMENTS OF MIL-STD-883. ALL SUPPORTING DOCUMENTATION AND RECORDS ARE RETAINED ON FILE BY LTC AND ARE AVAILABLE FOR INSPECTION. THE MAJOR ELEMENTS OF THE 883 PROGRAM ARE SHOWN BELOW.

Operation	Screening Procedure MIL-STD-883, Method 5004
Internal Visual	Method 2010, Condition B
Temperature Cycling	Method 1010, Condition C, 10 cycles -65°C to 150°C
Constant Acceleration	Method 2001, Condition E, 30k g Y1 axis (TO-3 PKG Condition D at 20k g)
Fine Leak	Method 1014, Condition A
Gross Leak	Method 1014, Condition C
Burn-in	Method 1015, 160 hrs at 125°C (or equivalent)
Final Electrical	+25°C DC (per LTC Data Sheet) PDA = 5%
	+125°C or 150°C DC
	-55°C DC
	+25°C AC
QA Acceptance	Method 5005 Group A (sample/lot)
Quality Conformance	Group B (sample/lot)
	Group C (sample every 6 months/Circuit Group)
	Group D (sample every 6 months/Package Family)
External Visual	Method 2009

EXAMPLE

**NOTE:** Each operation is performed on a 100% basis unless otherwise stated.

FORM No. 00-03-6072

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

# MILITARY PRODUCTS

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

## GROUP A DATA Mil-Std-883, METHOD 5005

LTC P/N: \_\_\_\_\_ LOT #: \_\_\_\_\_  
 GENERIC TYPE: \_\_\_\_\_ PKG: \_\_\_\_\_ DATE CODE: \_\_\_\_\_  
 ASSEMBLY LOC: \_\_\_\_\_

	ACC #	S/S	# FAILED	DATE TESTED	OPER NUMBER
<b>SUBGROUP 1</b> Static tests at 25°C	0	116			
<b>SUBGROUP 2</b> Static tests at maximum rated operating temperature	0	116			
<b>SUBGROUP 3</b> Static tests at minimum rated operating temperature	0	116			
<b>SUBGROUP 4</b> Dynamic tests at 25°C	0	116			
<b>SUBGROUP 5</b> Dynamic tests at maximum rated operating temperature	0	116			
<b>SUBGROUP 6</b> Dynamic tests at minimum rated operating temperature	0	116			
<b>SUBGROUP 7</b> Functional tests at 25°C	0	116			
<b>SUBGROUP 8</b> Functional tests at maximum and minimum operating temperature	0	116			
<b>SUBGROUP 9</b> Switching tests at 25°C	0	116			
<b>SUBGROUP 10</b> Switching tests at maximum rated operating temperature	0	116			
<b>SUBGROUP 11</b> Switching tests at minimum rated operating temperature	0	116			

**EXAMPLE**

QA APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM No. 00-03-6037

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

**GROUP B DATA (Class B)**  
 Mil-Std-883, METHOD 5005

LTC P/N: \_\_\_\_\_ LOT #: \_\_\_\_\_  
 GENERIC TYPE: \_\_\_\_\_ PKG: \_\_\_\_\_ DATE CODE: \_\_\_\_\_  
 ASSEMBLY LOC: \_\_\_\_\_

TEST	METHOD	CONDITION	SAMPLE SIZE SERIES	ACC #	S/S	# FAILED	DATE TESTED	OPER #
<b>SUBGROUP 2</b> Resistance to Solvents	2015			0	3			
<b>SUBGROUP 3</b> Solderability	2003	Soldering Temp. of 245°C ± 5°C	10	0				
<b>SUBGROUP 5</b> Bond Strength	2011	C or D	15	0				

QA APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM No. 00-03-6006

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

**GROUP C DATA (Class B)**  
 Mil-Std-883, METHOD 5005

LTC P/N: \_\_\_\_\_ LOT #: \_\_\_\_\_  
 GENERIC TYPE: \_\_\_\_\_ PKG: \_\_\_\_\_ DATE CODE: \_\_\_\_\_  
 \_\_\_\_\_ CT. GROUP: \_\_\_\_\_

TEST	METHOD	CONDITION	SAMPLE SIZE SERIES	ACC #	S/S	# FAILED	DATE TESTED	OPER #
<b>SUBGROUP 1</b> Steady State Life Test Electrical Endpoints	1005	T <sub>A</sub> = 125°C (1000 Hours or Equiv.) Test #	5	0	45			

QA APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

FORM No. 00-03-6007

# MILITARY PRODUCTS

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

## GROUP B DATA (Class S) Mil-Std-883, METHOD 5005

LTC P/N: \_\_\_\_\_ LOT #: \_\_\_\_\_  
 GENERIC TYPE: \_\_\_\_\_ PKG: \_\_\_\_\_ DATE CODE: \_\_\_\_\_  
 ASSEMBLY LOC: \_\_\_\_\_

TEST	METHOD	CONDITION	SAMPLE SIZE SERIES	ACC #	S/S	# FAILED	DATE TESTED	OPER #
<b>SUBGROUP 1</b> Physical Dimensions Internal Water-Vapor Content	2016 1018	5000 ppm Max						
<b>SUBGROUP 2</b> Resistance to Solvents Internal Visual and Mechanical Bond Strength Die Shear Test	2015 2013, 2014 2011 2019	Design and Construction Requirements C or D	10	0 0 0 0	3 2 22 Wires 3			
<b>SUBGROUP 3</b> Solderability	2003 or 2022	Soldering Temp. of 245°C ±5°C	10	0	22 Leads			
<b>SUBGROUP 4</b> Lead Integrity Seal Fine Gross Lid Torque	2004 1014   2024	B <sub>2</sub> (Lead Fatigue)   Glass Frit Seal Only	5	0	45 Leads			
<b>SUBGROUP 5</b> Electrical End-Points Steady State Life Electrical End-Points	1005	Test # C, D, or E Test #	5	0	45			
<b>SUBGROUP 6</b> Electrical End-Points Temperature Cycling Constant Acceleration Seal Fine Gross Electrical End-Points	1010 2001 1014	Test # C 100 Cycles E Y <sub>1</sub> Only (TO-3 at Condition D, 20Kg)  Test #	15	0	15			
<b>SUBGROUP 7</b> ESD Classification	3015	Qual or Re-Design Only	15	N/A	—			

EXAMPLE

QA APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

LINEAR TECHNOLOGY CORPORATION  
 1630 McCarthy Blvd.  
 Milpitas, CA 95035-7487

**GROUP D DATA (Class B or S)**  
 Mil-Std-883, METHOD 5005

LTC P/N: \_\_\_\_\_ LOT #: \_\_\_\_\_  
 GENERIC TYPE: \_\_\_\_\_ PKG: \_\_\_\_\_ DATE CODE: \_\_\_\_\_  
 ASSEMBLY LOC: \_\_\_\_\_

TEST	METHOD	CONDITION	SAMPLE SIZE SERIES	ACC #	S/S	# FAILED	DATE TESTED	OPER #
<b>SUBGROUP 1</b> Physical Dimensions	2016		15	0	15			
<b>SUBGROUP 2</b> Lead Integrity	2004	B <sub>2</sub> (Lead Fatigue)	5	0	45 Leads			
Fine Leak	1014							
Gross Leak	1014							
<b>SUBGROUP 3</b> Thermal Shock	1011	B Min. 15 Cycles	15	0	15			
Temperature Cycle	1010	C 100 Cycles						
Moisture Resistance	1004							
Fine Leak	1014							
Gross Leak	1014							
Visual Examination	1004/ 1010							
Electrical End-Points		Test #						
<b>SUBGROUP 4</b> Mechanical Shock	2002	B	15	0	15			
Vibration, Variable Frequency	2007	A						
Constant Acceleration	2001	E Y1 Only						
Fine Leak	1014							
Gross Leak	1014	(TO-3 at Condition D, 20Kg)						
Visual Examination	1010/ 1011							
Electrical End-Points		Test #						
<b>SUBGROUP 5</b> Salt Atmosphere	1009	A		15	0	15		
Fine Leak	1014							
Gross Leak	1014							
Visual Examination	1009	Visual Criteria						
<b>SUBGROUP 6</b> Internal Water-Vapor	1018	5000 ppm Max		0	3			
<b>SUBGROUP 7</b> Adhesion of Lead Finish	2025		15	0	15			
<b>SUBGROUP 8</b> Lid Torque	2024	Glass Frit Seal Only		0	5			

**EXAMPLE**

QA APPROVAL: \_\_\_\_\_ DATE: \_\_\_\_\_

# MILITARY PRODUCTS

## MILITARY PARTS LIST

<b>JAN S QPL</b>	JM38510/10103SGA (LM101AH) JM38510/10103SHA (LM101AW) JM38510/10103SPA (LM101AJ8) JM38510/10104SCA (LM108AJ) JM38510/10104SQA (LM108AH) JM38510/10104SHA (LM108AW) JM38510/10104SPA (LM108AJ8) JM38510/10107SGA (LM1118H) JM38510/10304SGA (LM1111H)	JM38510/10306SCA (LM119J) JM38510/10306SIA (LM119H) JM38510/10306SHA (LM119W) JM38510/10307SCA (LT119AJ) JM38510/10307SIA (LT119AH) JM38510/10307SHA (LT119AW) JM38510/11401SPA (LF155J8) JM38510/11402SGA (LF156H)	JM38510/11402SPA (LF156J8) JM38510/11404SGA (LF155AH) JM38510/11404SPA (LF155AJ8) JM38510/11405SGA (LF156AH) JM38510/11405SPA (LF156AJ8) JM38510/11703SXA (LM1117H) JM38510/11704SXA (LM117K) JM38510/11803SXA (LM137H)	JM38510/11804SYA (LM137K) JM38510/12407SGA (LT1021-5H) JM38510/12408SGA (LT1021-7H) JM38510/12409SGA (LT1021-10H) JM38510/12501SGA (LF198H) JM38510/13502SGA (OP07H) JM38510/13502SPA (OP07J8) JM38510/14802SXA (LT1009H)		
<b>JAN B QPL</b>	JM38510/10103BCA (LM101AJ) JM38510/10103BGA (LM101AH) JM38510/10103BHA (LM101AW) JM38510/10103BPA (LM101AJ8) JM38510/10104BCA (LM108AJ) JM38510/10104BGA (LM108AH) JM38510/10104BPA (LM108AJ8) JM38510/10106BEA (LH2108AD) JM38510/10107BCA (LM118J) JM38510/10107BGA (LM118H) JM38510/10107BHA (LM118W)	JM38510/10107BPA (LM118J8) JM38510/10304BGA (LM1111H) JM38510/10306BIA (LM119H) JM38510/10306BGA (LM119J) JM38510/10306BHA (LM119W) JM38510/10307BCA (LT119AJ) JM38510/10307BIA (LT119AH) JM38510/10307BHA (LT119AW) JM38510/11401BGA (LF155H) JM38510/11401BPA (LF156J8)	JM38510/11402BGA (LF156H) JM38510/11402BHA (LF156W) JM38510/11402BPA (LF156J8) JM38510/11404BGA (LF155AH) JM38510/11404BPA (LF155AJ8) JM38510/11405BGA (LF156AH) JM38510/11405BHA (LF156W) JM38510/11405BPA (LF156AJ8) JM38510/11703BXA (LM117H) JM38510/11704BXA (LM117K)	JM38510/11706BYA (LM138K) JM38510/11803BXA (LM137H) JM38510/11804BYA (LM137K) JM38510/12407BGA (LT1021-5H) JM38510/12408BGA (LT1021-7H) JM38510/12409BGA (LT1021-10H) JM38510/12501BGA (LF198H) JM38510/13502BGA (OP07H) JM38510/13502BPA (OP07J8) JM38510/14802BXA (LT1009H)		
<b>DESC Drawings</b>	7703401XA (LM117H) 7703401YA (LM117K) 7703402XA (LM117HVH) 7703402YA (LM117HVK) 7703403XA (LM137H) 7703403YA (LM137K) 7703404XA (LM137HVH) 7703404YA (LM137HVK)	7703405XA (LT117AH) 7703405YA (LT117AK) 7703406XA (LT137AH) 7703406YA (LT137AK) 7703407XA (LT117AHVH) 7703407YA (LT117AHVK) 7703408XA (LT137AHVH) 7703408YA (LT137AHVK)	8203602GA (OP07H) 8203602PA (OP07J8) 8418001XA (LM136AH-2.5) 7703406YA (LT137AK) 8551401PA (REF02AJ8) 8600801EA (LT685) 8601401CA (LM119J)	8601401HA (LM119W) 8601401IA (LM119H) 8601402CA (LT119AJ) 8601402HA (LT119AW) 8601402IA (LT119AH) 8687702XA (LT111AH) 8687702PA (LT111AJ8)		
<b>Standard Military Drawings (SMD)</b>	5962-3870701MGA (LTC1044MH) 5962-3870701MPA (LTC1044MJ) 5962-8680601EA (LT1846J) 5962-8680602EA (LT1847J) 5962-8684501IA (LT1016MH) 5962-8684501PA (LT1016MJ8) 5962-8686101XA (LT5805H) 5962-8686102XA (LT5807H) 5962-8686103XA (LT5809H) 5962-8687701GA (LM111AH) 5962-8687701PA (LT111AJ8) 5962-8688201XA (LH0070-0H) 5962-8688202XA (LH0070-1H) 5962-8688203XA (LH0070-2H) 5962-8757801GA (LT1007AMH) 5962-8757801PA (LT1007AMJ8) 5962-8759401XA (LM185H-1.2) 5962-8759402XA (LM185H-2.5) 5962-8760401GA (LM110H) 5962-8760401PA (LM10J8) 5962-8766601YA (LT1080MJ) 5962-8766602EA (LT1081MJ) 5962-8767501XA (LM150K) 5962-8767502XA (LT150AK) 5962-8771501CA (LT1002AMJ) 5962-8773801GA (LT1001MH) 5962-8773801PA (LT1001MJ8) 5962-8773803GA (LT1001AMH) 5962-8773803PA (LT1001AMJ8) 5962-8774101XA (LT1033MK) 5962-877501YA (LM123K) 5962-877502YA (LM123AK) 5962-8853701GA (OP37AH) 5962-8853701PA (OP37AJ8) 5962-8853702GA (OP37BH) 5962-8853702PA (OP37BJ8) 5962-8853703GA (OP37CH) 5962-8853703PA (OP37CJ8) 5962-8856101XA (LM199AH) 5962-8856102XA (LM199H) 5962-8856201XA (LT1010MH) 5962-8856201YA (LT1010MK) 5962-8856701GA (LT1037AMH) 5962-8856701PA (LT1037AMJ8) 5962-8859701XA (LT1004MH-1.2) 5962-8859702XA (LT1004MH-2.5) 5962-8860001GA (LT1021BMH-10) 5962-8860002GA (LT1021CMH-10)	5962-8860003GA (LT1021DMH-10) 5962-8862201XA (LT1028MH) 5962-8862201PA (LT1028MJ8) 5962-8862202XA (LT1028AMH) 5962-8862202PA (LT1028AMJ8) 5962-8864101RA (LTC1060AMJ) 5962-8864102RA (LTC1060MJ) 5962-8864601XA (LT1085MK) 5962-8864701GA (LT1021BMH-7) 5962-8864702GA (LT1021DMH-7) 5962-8875101YA (LT1039MJ) 5962-8875102EA (LT1039MJ16) 5962-8876001GA (LT1013AMH) 5962-8876001PA (LT1013AMJ8) 5962-8876002GA (LT1013MH) 5962-8876002PA (LT1013MJ8) 5962-8876201GA (LT1021BMH-5) 5962-8876202GA (LT1021CMH-5) 5962-8876203GA (LT1021DMH-5) 5962-8944001CA (LT1032MJ) 5962-8948301LA (LTC1064MJ) 5962-8950401GA (LT1017MH) 5962-8950401PA (LT1017MJ8) 5962-8950402GA (LT1018MH) 5962-8950402PA (LT1018MJ8) 5962-8951101EA (LT1525AJ) 5962-8951102EA (LT1527AJ) 5962-8952101XA (LT1084MK) 5962-8956201GA (LT1054MH) 5962-8956201PA (LT1054MJ8) 5962-8958101GA (REF01AH) 5962-8958101PA (REF01AJ8) 5962-8961001XA (LT1009MH) 5962-8962201GA (LT1022AMH) 5962-8962202GA (LT1022MH) 5962-8967701CA (LT1014AMJ) 5962-8967702CA (LT1014MJ) 5962-8967702XA (LT1410MW) 5962-8978201CA (LTC1052MJ) 5962-8978201PA (LTC1052MH) 5962-8978201PA (LTC1052MJ8) 5962-8980201XA (LT1031BMH) 5962-8980202XA (LT1031CMH) 5962-8980203XA (LT1031DMH) 5962-8983002RA (LTC1290BMJ) 5962-8983003RA (LTC1290CMJ) 5962-8983004RA (LTC1290DMJ)	5962-8987301YA (LT1003MK) 5962-8989701CA (LT1058AMJ) 5962-8989701XA (LT1058AML) 5962-8989702CA (LT1058MJ) 5962-8992101XA (LM129AH) 5962-8992102XA (LM129BH) 5962-8992103XA (LM129CH) 5962-8997601GA (LT1055AMH) 5962-8997602GA (LT1056AMH) 5962-8997603GA (LT1055MH) 5962-8997604GA (LT1056MH) 5962-8998101XA (LT1086MK) 5962-8998101YA (LT1086MH) 5962-9050701XA (LM134H-3) 5962-9050702XA (LM134H-6) 5962-9050703XA (LM134H) 5962-9050704XA (LT1029AMH) 5962-9051902XA (LT1029MH) 5962-9054501RA (LTC1045MJ) 5962-9056801CA (OP237AJ) 5962-9056802CA (OP237CJ) 5962-9059501GA (LT1019AMH-10) 5962-9059502GA (LT1019AMH-5) 5962-9059503GA (LT1019AMH-4.5) 5962-9059504GA (LT1019AMH-2.5) 5962-9059505GA (LT1019MH-10) 5962-9059506GA (LT1019MH-5) 5962-9059507GA (LT1019MH-4.5) 5962-9059508GA (LT1019MH-2.5) 5962-9062701GA (LT1011AMH) 5962-9062701PA (LT1011AMJ8) 5962-9062702GA (LT1011MH) 5962-9062702PA (LT1011MJ8) 5962-9064901CA (LTC1064-4MJ) 5962-9064901XA (LTC1064-4ML) 5962-9069301MCA (LTC1064-1MJ/883) 5962-9069302MCA (LTC1064-1AMJ/883) 5962-9073902MXA (LT1084-5MK) 5962-9073903MXA (LT1085-5MK) 5962-9073904MXA (LT1086-5MK) 5962-9081701MXA (LT1057AMH) 5962-9081701MPA (LT1057AMJ8) 5962-9081702MXA (LT1057MH) 5962-9081702MPA (LT1057MJ8) 5962-9082501MYA (LT1070MK) 5962-9082502MYA (LT1071MK) 5962-9082503MYA (LT1072MK)	5962-9082503MPA (LT1072MJ8) 5962-9082504MYA (LT1070HVMK) 5962-9082505MYA (LT1071HVMK) 5962-9082506MYA (LT1072HVMK) 5962-9084101MCA (LT1020MJ) 5962-9084201MGA (LT1012MH) 5962-9084201MPA (LT1012MJ8) 5962-9084202MGA (LT1012AMH) 5962-9084202MPA (LT1012AMJ8) 5962-9159501MPA (LTC1062MJ8) 5962-9161901MPA (LTC1042MJ8) 5962-9163201MCA (LT1086MK) 5962-9163202MCA (LT1079AMJ) 5962-9163203MCA (LT1078MJ) 5962-9163204MCA (LT1078AMH) 5962-9163204MPA (LT1078AMJ8) 5962-9172901MVA (LT1180MJ) 5962-9172902MEA (LT1181MJ) 5962-9172903MVA (LT1280MJ) 5962-9172904MEA (LT1281MJ) 5962-9207901MPA (LT1172MJ8) 5962-9207901MPA (LT1172MJ8) 5962-9208001MPA (LTC485MJ8) 5962-9305701MPA (LTC1291CMJ8) 5962-9305702MPA (LTC1292CMJ8) 5962-9305703MEA (LT1093MH) 5962-9305704MPA (LTC1294CMJ) 5962-9311901MYA (LT1076MK) 5962-9311902MYA (LT1076HVMK) 5962-9318401MPA (LT1229MJ8) 5962-9318402MCA (LT1230MJ) 5962-9319001MPA (LT1241MJ8) 5962-9319002MPA (LT1242MJ8) 5962-9319003MPA (LT1243MJ8) 5962-9319004MPA (LT1244MJ8) 5962-9319005MPA (LT1245MJ8) 5962-9321201MPA (LT1111MJ8) 5962-9322401MPA (LT1224MJ8) 5962-9323801MCA (LT1125MJ) 5962-9323802MPA (LT1244MJ8) 5962-9323803MCA (LT1125AMJ) 5962-9323804MPA (LT1124AMJ8) 5962-9451601MPA (LT118AJ8) 5962-9460001MGA (LTC1051MH) 5962-9460002MGA (LTC1051AMH) 5962-9470901MPA (LTC1041MJ8)		
<b>Radiation Hardened</b>	RH07 RH27C RH37C RH101A RH108A	RH111 RH117 RH118 RH119	RH129 RH137 RH1009 RH1011	RH1013 RH1014 RH1021-5 RH1021-7	RH1021-10 RH1056 RH1078 RH1079	RH1083 RH1084 RH1085 RH1086

## 883 MILITARY PARTS LIST

<b>883 Operational Amplifiers</b>	LF155AH/883	LM101AH/883	LT1006MH/883	LT1024MD/883	LT1172MJ/883	OP-05H/883	OP-27BH/883	
	LF155H/883	LM101AJ/883	LT1006MJ/883	LT1055AMH/883	LT1228MJ/883	OP-05J/883	OP-27CH/883	
	LF156AH/883	LM107H/883	LT1007AMH/883	LT1055MH/883	LTC1050AMH/883	OP-05AW/883	OP-27CJ/883	
	LF156H/883	LM107J/883	LT1007AMJ/883	LT1078AMH/883	LTC1050AMJ/883	OP-05W/883	OP-37AH/883	
	LF156J/883	LM108AH/883	LT1007MH/883	LT1078AMJ/883	LTC1050AMJ/883	OP-07AH/883	OP-37AJ/883	
	LF156W/883	LM108H/883	LT1007MJ/883	LT1078MH/883	LTC1050MH/883	OP-07AJ/883	OP-37BJ/883	
	LF412AMH/883	LM108AJ/883	LT1008MH/883	LT1078MJ/883	LTC1050MJ/883	OP-07H/883	OP-37CH/883	
	LF412MH/883	LT118AH/883	LT1012MD/883	LT1079AMJ/883	LTC1050MJ/883	OP-07J/883	OP-37CJ/883	
	LF412AMJ/883	LT118AJ/883	LT1012MH/883	LT1079MJ/883	LTC1051AMH/883	OP-15AH/883	OP-227CJ/883	
	LF412MJ/883	LT1001AMH/883	LT1012MH/883	LT1124AMJ/883	LTC1051AMJ/883	OP-15BH/883	OP-237AJ/883	
	LH0070-0H/883	LT1001AMJ/883	LT1013AMH/883	LT1124MJ/883	LTC1051MJ/883	OP-15CH/883	OP-237CJ/883	
	LH0070-1H/883	LT1001MH/883	LT1013AMJ/883	LT1125AMJ/883	LTC1052MH/883	OP-15CJ/883		
	LH0070-2H/883	LT1001MJ/883	LT1013MH/883	LT1125MJ/883	LTC1052MJ/883	OP-16AH/883		
	LH2108AD/883	LT1002AMJ/883	LT1013MJ/883	LT1126AMJ/883	LTC1052MJ/883	OP-16BH/883		
	LH2108D/883	LT1002MJ/883	LT1014AMJ/883	LT1126MJ/883	LTC1150MJ/883	OP-16CH/883		
	LM10H/883	LT1006AMH/883	LT1014MJ/883	LT1127AMJ/883	OP-05AH/883	OP-16CJ/883		
	LM10J/883	LT1006AMJ/883	LT1024AMD/883	LT1127MJ/883	OP-05AJ/883	OP-27BJ/883		
	<b>883 High Speed Op Amps</b>	LM118H/883	LT1028AMH/883	LT1037AMJ/883	LT1057AMH/883	LT1058AML/883	LT1191MJ/883	
		LM118J/883	LT1028AMJ/883	LT1037MH/883	LT1057AMJ/883	LT1058MJ/883	LT1192MJ/883	
LM118W/883		LT1028MH/883	LT1037MJ/883	LT1057MH/883	LT1187MJ/883	LT1193MJ/883		
LT1022AMH/883		LT1028MJ/883	LT1056AMH/883	LT1057MJ/883	LT1189MJ/883	LT1194MJ/883		
LT1022MH/883		LT1037AMH/883	LT1056MH/883	LT1058AMJ/883	LT1190MJ/883	LT1195MJ/883		
<b>883 Regulators</b>	LM117H/883	LM137HVK/883	LT117AK/883	LT150AK/883	LT1035MK/883	LT1076HVMK/883	LT1086MH/883	
	LM117HVH/883	LM137K/883	LT123AK/883	LT1003MK/883	LT1036MK/883	LT1083MK-5/883	LT1086MK/883	
	LM117HVK/883	LM138K/883	LT137AH/883	LT1055MK/883	LT1054MJ/883	LT1083MK-12/883	LT1086MK-5/883	
	LM117K/883	LM150K/883	LT137AHVH/883	LT1020MJ/883	LT1054MH/883	LT1084MK/883	LT1086MK-12/883	
	LM123K/883	LT117AH/883	LT137AHVK/883	LT1026MJ/883	LT1074MK/883	LT1084MK-5/883	LT1120MJ/883	
	LM137H/883	LT117AHVH/883	LT137AK/883	LT1026MH/883	LT1074HVMK/883	LT1084MK-12/883		
	LM137HVH/883	LT117AHVK/883	LT138AK/883	LT1033MK/883	LT1076MK/883	LT1085MK/883		
<b>883 References</b>	LM129AH/883	LM185H-1.2/883	LT581SH/883	LT1019AMH-5/883	LT1021DMH-5/883	LT1031BMH/883	REF-01AJ/883	
	LM129BH/883	LM185H-2.5/883	LT581TH/883	LT1019AMH-10/883	LT1021BMH-7/883	LT1031CMH/883	REF-01H/883	
	LM129CH/883	LM199AH/883	LT581UH/883	LT1019MH-2.5/883	LT1021DMH-7/883	LT1031DMH/883	REF-01J/883	
	LM134H/883	LM199AH-20/883	LT1004MH-1.2/883	LT1019MH-4.5/883	LT1021BMH-10/883	LT1034BMH-1.2/883	REF-02AH/883	
	LM134H-3/883	LM199H/883	LT1004MH-2.5/883	LT1019MH-5/883	LT1021CMH-10/883	LT1034BMH-2.5/883	REF-02AJ/883	
	LM134H-6/883	LT580SH/883	LT1009MH/883	LT1019MH-10/883	LT1021DMH-10/883	LT1034MH-1.2/883	REF-02H/883	
	LM136AH-2.5/883	LT580TH/883	LT1019AMH-2.5/883	LT1021BMH-5/883	LT1029AMH/883	LT1034MH-2.5/883	REF-02J/883	
	LM136H-2.5/883	LT580UH/883	LT1019AMH-4.5/883	LT1021CMH-5/883	LT1029MH/883	REF-01AH/883		
<b>883 Comparators</b>	LM111H/883	LM119W/883	LT119AJ/883	LT1011AMJ/883	LT1016MJ/883	LT1017MJ/883		
	LM111J/883	LT111AH/883	LT685MH/883	LT1011MH/883	LT1016MJ/883	LT1018MH/883		
	LM119H/883	LT111AJ/883	LT685MJ/883	LT1011MJ/883	LT1016ML/883	LT1018MJ/883		
	LM119J/883	LT119AH/883	LT1011AMH/883	LT1016MH/883	LT1017MH/883	LTC1042MJ/883		
<b>883 Switched-Mode Control Circuits</b>	LT1070MK/883	LT1072MK/883	LT1242MJ/883	LT1525AJ/883	SG1525AJ/883			
	LT1070HVMK/883	LT1072HVMK/883	LT1243MJ/883	LT1527AJ/883	SG1527AJ/883			
	LT1071MK/883	LT1072MJ/883	LT1244MJ/883	LT1846J/883				
	LT1071HVMK/883	LT1241MJ/883	LT1245MJ/883	LT1847J/883				
<b>883 Interface</b>	LT1032MJ/883	LT1080MJ/883	LT1181AMJ/883	LTC485MJ/883				
	LT1039MJ/883	LT1081MJ/883	LT1280MJ/883	LTC1045MJ/883				
	LT1039MJ16/883	LT1180AMJ/883	LT1281MJ/883					
<b>883 Filters</b>	LTC1059MJ/883	LTC1061MJ/883	LTC1064-1AMJ/883	LTC1064-4MJ/883	LTC1164-5MJ/883			
	LTC1060AMJ/883	LTC1062MJ/883	LTC1064-1MJ/883	LTC1064-4ML/883	LTC1164-7MJ/883			
	LTC1060MJ/883	LTC1063MJ/883	LTC1064-2MJ/883	LTC1164MJ/883				
	LTC1061AMJ/883	LTC1064MJ/883	LTC1064-2ML/883	LTC1164AMJ/883				
<b>883 Data Converters</b>	LTC1094MJ/883	LTC1290DMJ/883	LTC1293DMJ/883	LTC1294DMJ/883				
	LTC1290BMJ/883	LTC1293BMJ/883	LTC1294BMJ/883					
	LTC1290CMJ/883	LTC1293CMJ/883	LTC1294CMJ/883					
<b>Other 883</b>	LF198AH/883	LT1010MH/883	LTC201AMJ/883	LTC1043MJ/883	LTC1044MJ/883			
	LF198H/883	LT1010MK/883	LTC1041MJ/883	LTC1044MH/883				

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