

REVISIONS

Letter	ECO No.	Description	Checked	Approved	Date
A	36-108	INITIAL RELEASE	G.G.	EAB	10/20/94
B	36-117	DEFINE DYNAMIC SHUTDOWN AND TESTING	<i>GG</i>	<i>KT</i>	<i>12.15.94</i>

NAME	DATE	MASSACHUSETTS INSTITUTE OF TECHNOLOGY CENTER FOR SPACE RESEARCH		
Drawn: BRIAN KLATT	9/21/94	MICROCIRCUITS, LINEAR, OPERATIONAL AMPLIFIER, HIGH SPEED, PROGRAMMABLE SUPPLY CURRENT, MONOLITHIC		
Checked: Gordon C. Gong	10/20/94	Size	Code Identification No.	Drawing No.
Approved: Ed Boughan	10/20/94	T	80230	36-02304
Released: K. Tibbetts	10/20/94			Rev. B
		Scale: NONE	Sheet: 1 of 4	

1.0 SCOPE

- 1.1 Introduction This drawing describes device requirements for a high speed, programmable-supply current, monolithic operational amplifier used in flight hardware for a space experiment on the AXAF CCD Imaging Spectrometer (ACIS) Instrument. The part described herein is a Comlinear Corporation, P/N CLC505A8D. These devices are compliant, non-JAN devices per paragraph 1.2.1 of MIL-STD-883.
- 1.2 Part Number The complete MIT part number shall be 36-02304
- 1.3 Absolute maximum ratings Absolute maximum ratings are in accordance with paragraph 1.3 of SMD 5962-90993.
- 1.4 Recommended operating conditions Recommended operating conditions are in accordance with paragraph 1.4 of SMD 5962-90993.

2.0 APPLICABLE DRAWINGS

- 2.1 Government Specifications and Standards Unless otherwise specified, the following specifications and standards, of the latest released issue, form a part of this drawing, to the extent specified herein.

SPECIFICATIONS

MILITARY

5962-90993	Microcircuits, Linear, Operational Amplifier, High Speed, Programmable Supply Current, Monolithic Silicon
MIL-M-38510	Microcircuits, General Specification for

STANDARDS

MIL-STD-883	Test Methods and Procedures for Microelectronics
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- 2.2 Order of precedence In the event of conflict between the text of this drawing and the references cited herein, the text of this drawing shall govern.

3.0 REQUIREMENTS

General Requirements

- 3.1.1 Item Requirements The microcircuits described herein shall, in all respects, meet the requirements of this specification and 5962-90993 for a class M microcircuit. These microcircuits shall be fabricated and tested using production and test facilities and a Reliability and Quality Assurance program adequate to assure successful compliance with this specification and 5962-90993. Op Amps supplied in accordance with this specification shall be compliant 5962-9099301MPA devices which have been tested 100% for dynamic shutdown capability, Radiographic Inspection, and Particle Impact Noise Detection (paragraphs 4.2.3, 4.2.1, and 4.2.2 herein, respectively). In addition, DPA is performed on one (1) sample device per paragraph 4.4 herein.

- 3.1.2 **Procuring Activity** For the purposes of this specification and documents referenced herein, the procuring activity is the Massachusetts Institute of Technology (MIT), Center for Space Research (CSR).
- 3.1.3 **Product Changes** The supplier(s) shall notify MIT of proposed changes to Microcircuits, including changes in design, materials, fabrication methods, or processes, and changes which may affect the quality or intended end use.
- 3.2 **Part marking** Microcircuit marking shall meet the intent of paragraph 3.5 of 5962-90993.
- 3.2.1 **Part Number** Microcircuits shall be marked with the MIT part number; 36-02304.
- 3.3 **Electrical performance characteristics** Unless otherwise specified, the electrical performance characteristics are as specified in table 1 of 5962-90993, and apply over the full operating temperature range.
- 3.3.1 **Dynamic Shutdown Capability** Turn-on time and turn-off time, of Op Amps specified herein, shall not exceed 1 μ s when tested in accordance with paragraph 4.2.3 herein.
- 3.4 **Design and Construction Requirements**
- 3.4.1 **Package** The package shall be an 8 lead dual-in-line package, outline letter P, per paragraph 1.2.4 of 5962-90993.
- 3.4.2. **Lead Finish** The lead finish shall be "A" per MIL-M-38510.
- 3.4.3 **Terminal connections** The terminal connections shall be per figure 1, of 5962-90993.
- 4.0 QUALITY ASSURANCE PROVISIONS**
- 4.1 **Responsibility for Inspection** Unless otherwise specified herein, the manufacturer is responsible for the performance of all examinations and tests as specified herein.
- 4.2 **Screening** All Microcircuits (100%) shall be subjected to and pass the screen tests and examinations defined in paragraph 4.3 of 5962-90993.
- 4.2.1 **Xray** Microcircuits shall be subjected to and pass radiographic examination per MIL-STD-883, method 2012 on each device.
- 4.2.2 **Particle Impact Noise Detection (PIND)** Microcircuits shall be subjected to and pass PIND examination per MIL-STD-883, method 2020, condition B, on each device.
- 4.2.3 **Dynamic Shutdown Capability** Each microcircuit shall be tested for turn-on time and turn-off time per figure 1 herein. Devices shall meet the requirements of paragraph 3.3.1.
- 4.3 **Quality Conformance Inspection (QCI)** Quality conformance inspection shall be in accordance with paragraph 4.4.2 of 5962-90993.
- 4.4 **Destructive Physical Analysis (DPA)** An internal destructive examination shall be performed in accordance with MIL-STD-883, method 5009. Sample size shall be one (1).

Turn-on/turn-off Time Test Configuration

Amplifier is configured at $A_V = 2$ ($R_F = R_G = 1K$)

Input is connected to a 4Mhz, 0.1V_{p-p}, sinusoidal signal

R_p is connected via a 130K resistor to a 10V_{p-p}, 10 KHz square wave

Observe the time from the falling edge of the disable pulse to the appearance of the sinusoidal output.

Figure 1

4.5 Inspection and Test Records The supplier shall maintain inspection and test records for 36 months after hardware delivery to MIT. Test data for all electrical tests, screening, DPA, and QCI inspections shall be submitted to MIT with the delivery of flight parts.

4.6 Source Inspection

4.6.1 Government Source Inspection (GSI) The government has the right to inspect any or all of the work included in this order at the supplier's plant. In the event that Government Source Inspection (GSI) is imposed, the Government quality representative who has been delegated NASA quality assurance functions for this procurement shall be notified immediately upon receipt of this order. The Government representative shall also be notified 48 hours in advance of the time that parts are ready for inspection or test.

4.6.2 MIT Source Inspection MIT Performance Assurance will impose mandatory inspection points (MIPs) at wire bonding (precap visual examination) and final test, and must be notified 2 weeks before parts are ready for MIT Inspection. (call area code 617, phone 253-7555).

5.0 **PACKAGING**

5.1 Packaging requirements Packaging shall be in accordance with paragraph 5.1 of 5962-90993

6.0 **NOTES**

6.1 Approved Source of Supply

Comlinear Corporation
4800 Wheaton Drive
Fort Collins, CO 80525

Cage Code 62839