HS-OP470ARH

Radiation Hardened, Very Low Noise Quad Operational Amplifier

February 1998

Features

- **QML Qualified Per MIL-PRF-38535 Requirements**
- **Radiation Environment**
  - **Total Dose . . . . . 1 x 10^5 RAD(Si)**
- **Low Noise**
  - **At 1kHz . . . . . 4.3nV/$\sqrt{Hz}$ (Typ)**
  - **At 1kHz . . . . . 0.6pA/$\sqrt{Hz}$ (Typ)**
- **Low Offset Voltage. . . . . 2.1mV (Max)**
- **High Slew Rate . . . . . 1.7V/μs (Min)**
- **Gain Bandwidth Product . . . . . 8.0MHz (Typ)**

Applications

- **High Q, Active Filters**
- **Voltage Regulators**
- **Integrators**
- **Signal Generators**
- **Voltage References**
- **Space Environments**

Description

The HS-OP470ARH is a radiation hardened, monolithic quad operational amplifier that provides highly reliable performance in harsh radiation environments. Its excellent noise characteristics coupled with an unique array of dynamic specifications make this amplifier well-suited for a variety of satellite system applications. Dielectrically isolated, bipolar processing makes this device immune to Single Event Latch-up.

The HS-OP470ARH shows almost no change in offset voltage after exposure to 100K RAD(Si) gamma radiation, with only a minor increase in current. Complementing these specifications is a post radiation open loop gain in excess of 40kV/V.

This quad operational amplifier is available in an industry standard pinout, allowing for immediate interchangeability with most other quad operational amplifiers.

Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). SMD numbers must be used when ordering.

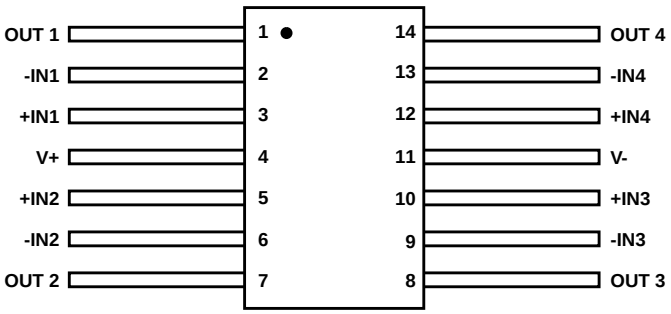
Detailed Electrical Specifications for this are contained in SMD 5962-98533. A "hot-link" is provided on our homepage with instructions for downloading. http://www.intersil.com/data/sm/index.htm

Ordering Information

SMD PART NUMBER	INTERSIL PART NUMBER	TEMP. RANGE (^{o}C)	PACKAGE	CASE OUTLINE
5962R9853301VXC	HS9-OP470ARH-Q	-55 to 125	14 Ld Flatpack	CDFP3-F14
N/A	HS9-OP470ARH/Sample	25	14 Ld Flatpack	CDFP3-F14

Pinout

HS-OP470ARH (FLATPACK)
TOP VIEW



File Number **4471**

Metallization Mask Layout

DIE DIMENSIONS:

95 mils x 99 mils x 19 mils ±1 mil
(2420µm x 2530µm x 483µm ±25.4µm)

METALLIZATION:

Type: Al, 1% Cu
Thickness: 16kÅ ±2kÅ

SUBSTRATE POTENTIAL (Powered Up):

Unbiased

BACKSIDE FINISH:

Silicon

PASSIVATION:

Type: Nitride (SI3N4) over Silox (SIO2, 5% Phos.)
Silox Thickness: 12kÅ ±2kÅ
Nitride Thickness: 3.5kÅ ±1.5kÅ

WORST CASE CURRENT DENSITY:

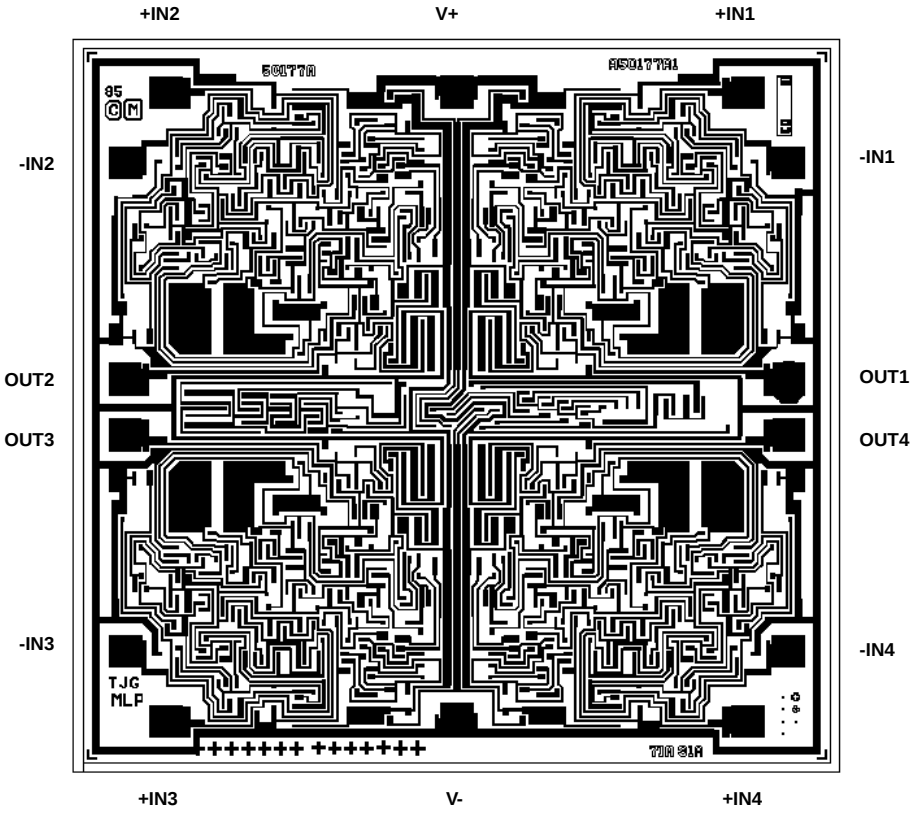
$<2.0 \times 10^5$ A/cm^2

TRANSISTOR COUNT:

175

PROCESS:

Bipolar Dielectric Isolation



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For information regarding Intersil Corporation and its products, see web site **http://www.intersil.com**

Sales Office Headquarters

NORTH AMERICA
Intersil Corporation
P. O. Box 883, Mail Stop 53-204
Melbourne, FL 32902
TEL: (321) 724-7000
FAX: (321) 724-7240

EUROPE
Intersil SA
Mercure Center
100, Rue de la Fusee
1130 Brussels, Belgium
TEL: (32) 2.724.2111
FAX: (32) 2.724.22.05

ASIA
Intersil (Taiwan) Ltd.
Taiwan Limited
7F-6, No. 101 Fu Hsing North Road
Taipei, Taiwan
Republic of China
TEL: (886) 2 2716 9310
FAX: (886) 2 2715 3029

HS-OP470ARH

Printer Friendly Version

Rad-Hard, Very Low Noise Quad Operational Amplifier

Datasheets, Related Docs & Simulations | Description | Key Features | Parametric Data | Related Devices

Ordering Information RoHS/Pb-Free/Green Device

Part No.	Design-In Status	Temp.	Package	MSL	SMD	Price US $	
HS0-OP470ARH-Q	Active	Mil	Die (Military Visual)	N/A	-	Contact Us	Buy
HS9-OP470ARH-Q	Active	-	14 Ld FlatPack	N/A	5962R9853301VXC	Contact Us	Buy
5962R9853301V9A	Coming Soon	Mil	14 Ld Other		-		

The price listed is the manufacturer's suggested retail price for quantities between 100 and 999 units. However, prices in today's market are fluid and may change without notice.

MSL = Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

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Key Features

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  - Total Dose 1 x 10^5 RAD(Si)
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  - At 1kHz 0.6pA/√Hz (Typ)
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- High Slew Rate 1.7V/µs (Min)
- Gain Bandwidth Product 8.0MHz (Typ)

Related Documentation

Datasheet(s):

- Radiation Hardened, Very Low Noise Quad Operational Amplifier

Military SMD(s):

- Radiation Hardened, Very Low Noise Quad Operational Amplifier

Technical Homepage:

- Military/Space ICs

Parametric Data

RH Level	100

Applications

- High Q, Active Filters
- Voltage Regulators
- Integrators
- Signal Generators
- Voltage References

Related Devices

Parametric Table

HS-5104ARH	Rad-Hard Low Noise Quad Operational Amplifier
ISL7124SRH	Single-Event Hardened, Single Supply, Quad Operational Amplifier