# HS-2600RH



#### Data Sheet

## August 1999 File Number 3650.1

## Radiation Hardened Wideband, High Impedance Operational Amplifier

HS-2600RH is a radiation hardened internally compensated bipolar operational amplifier that features very high input impedance coupled with wideband AC performance. The high resistance of the input stage is complemented by low offset voltage (4mV<sub>max</sub> at 25°C for HS-2600RH) and low bias and offset current (10nA max at 25°C for HS-2600RH) to facilitate accurate signal processing. Offset voltage can be reduced further by means of an external nulling potentiometer. The 4V/µs minimum slew rate at 25°C and the minimum open loop gain of 100kV/V at 25°C enables the HS-2600RH to perform high gain amplification of fast, wideband signals. These dynamic characteristics, coupled with fast settling times, make these amplifiers ideally suited to pulse amplification designs as well as high frequency or video applications. The frequency response of the amplifier can be tailored to exact design requirements by means of an external bandwidth control capacitor. Other high performance designs such as high gain, low distortion audio amplifiers, high-Q and wideband active filters and high speed comparators, are excellent uses of this part.

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

Detailed Electrical Specifications for these devices are contained in SMD 5962-95671. A "hot-link" is provided on our homepage for downloading. www.intersil.com/spacedefense/space.asp

## **Ordering Information**

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE ( <sup>o</sup> C)
5962D9567101VPA	HS7-2600RH-Q	-55 to 125
5962D9567101VPC	HS7B-2600RH-Q	-55 to 125

### Features

- Electrically Screened to SMD # 5962-95671
- QML Qualified per MIL-PRF-38535 Requirements

• High Input Impedance 100M $\Omega$ (Min) 500M $\Omega$ (Typ)
+ High Slew Rate
Low Input Bias Current
• Low Input Offset Current (HS-2600RH) 4mV (Max)
• Wide Unity Gain Bandwidth
Output Short Circuit Protection
Total Gamma Dose

## Applications

- Video Amplifier
- Pulse Amplifier
- High-Q Active Filters
- High Speed Comparators
- Low Distortion Oscillators

#### Pinout

HS7-2600RH (CERDIP) GDIP1-T8 OR HS7B-2600RH (SBDIP) CDIP2-T8 TOP VIEW



## Test Circuit



NOTE: For Detailed Information, Refer to HS-2600RH Test Technical Brief.

### **Test Waveforms**

#### SIMPLIFIED TEST CIRCUIT



#### SLEW RATE WAVEFORMS



#### OVERSHOOT, RISE AND FALL TIME WAVE FORMS





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## **Burn-In Circuit**

#### HS-2600RH CERDIP



#### NOTES:

- 1.  $R_1 = 1M\Omega, \pm 5\%, 1/4W$  (Min)
- 2.  $C_1 = C_2 = 0.01 \mu F/Socket$  (Min) or  $0.1 \mu F/Row$  (Min)
- 3. C<sub>3</sub> = 0.01µF/Socket (10%)
- 4. D<sub>1</sub> = D<sub>2</sub> = IN4002 or Equivalent/Board
- 5. | (V+) (V-) | = 30V

## Irradiation Circuit



NOTES:

- 6.  $V_1 = +15V \pm 10\%$
- 7.  $V_2 = -15V \pm 10\%$
- 8.  $R = 1M\Omega \pm 5\%$
- 9. C =  $0.1\mu F \pm 10\%$

## Schematic Diagram



## **Die Characteristics**

#### DIE DIMENSIONS:

69 mils x 56 mils x 19 mils ±1 mils 1750µm x 1420µm x 483µm ±25.4µm

#### INTERFACE MATERIALS:

#### Glassivation:

Type: Nitride (Si3N4) over Silox (SiO2, 5% Phos.) Silox Thickness: 12kÅ  $\pm 2kÅ$  Nitride Thickness: 3.5kÅ  $\pm 1.5kÅ$ 

#### **Top Metallization:**

Type: Al, 1% Cu Thickness: 16kÅ ±2kÅ

#### Substrate:

Linear Bipolar DI

#### **Backside Finish:**

Silicon

## Metallization Mask Layout

HS-2600RH



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#### ASSEMBLY RELATED INFORMATION:

Substrate Potential (Powered Up): Unbiased

### ADDITIONAL INFORMATION:

Worst Case Current Density: <2 x 10<sup>5</sup>A/cm<sup>2</sup>

#### **Transistor Count:**

140