

**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 ( $4mV_{max}$  at  $25^{\circ}C$  for HS-2600RH) and low bias and offset current ( $10nA$  max at  $25^{\circ}C$  for HS-2600RH) to facilitate accurate signal processing. Offset voltage can be reduced further by means of an external nulling potentiometer. The  $4V/\mu s$  minimum slew rate at  $25^{\circ}C$  and the minimum open loop gain of  $100kV/V$  at  $25^{\circ}C$  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](http://www.intersil.com/spacedefense/space.asp)

**Ordering Information**

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)
5962D9567101VPA	HS7-2600RH-Q	-55 to 125
5962D9567101VPC	HS7B-2600RH-Q	-55 to 125

**Features**

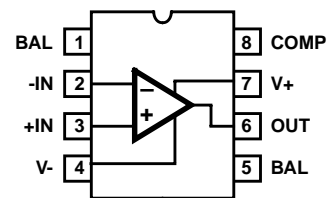
- Electrically Screened to SMD # 5962-95671
- QML Qualified per MIL-PRF-38535 Requirements
- High Input Impedance . . . . .  $100M\Omega$  (Min)  
 $500M\Omega$  (Typ)
- High Slew Rate. . . . .  $3V/\mu s$  (Min)  
 $7V/\mu s$  (Typ)
- Low Input Bias Current. . . . .  $10nA$  (Max)  
 $1nA$  (Typ)
- Low Input Offset Current (HS-2600RH) . . . . .  $4mV$  (Max)
- Wide Unity Gain Bandwidth . . . . .  $12MHz$  (Typ)
- Output Short Circuit Protection
- Total Gamma Dose. . . . .  $10kRAD(Si)$

**Applications**

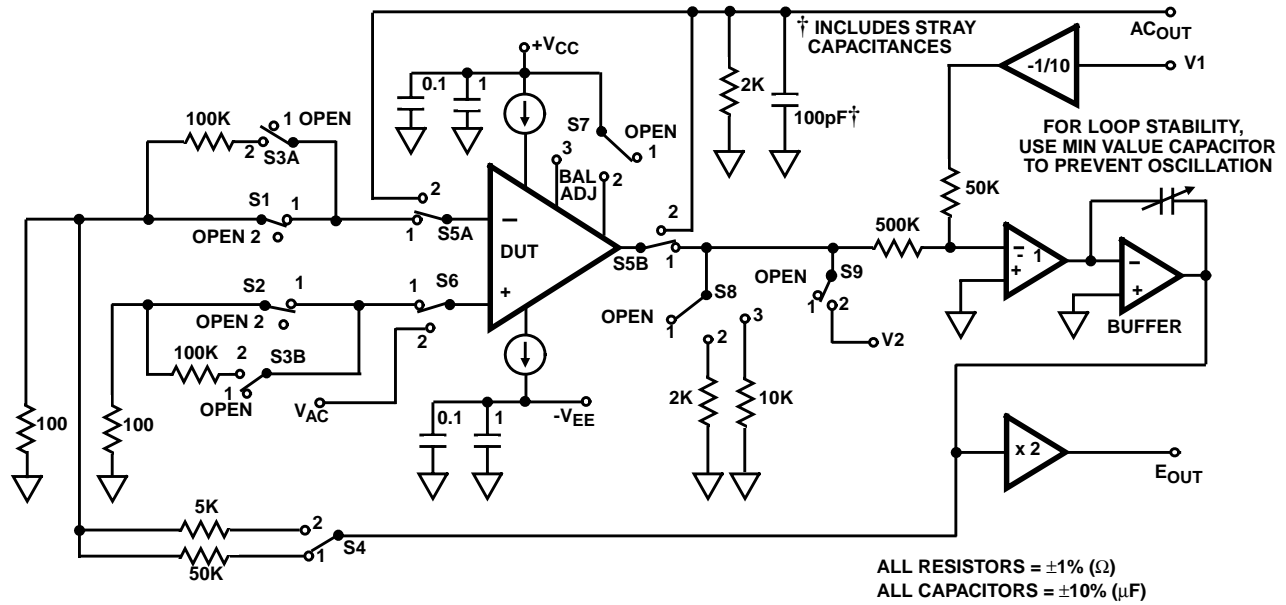
- Video Amplifier
- Pulse Amplifier
- High-Q Active Filters
- High Speed Comparators
- Low Distortion Oscillators

**Pinout**

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



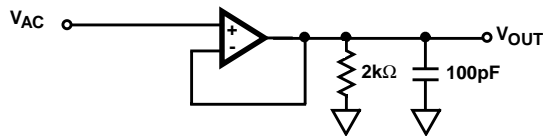
Test Circuit



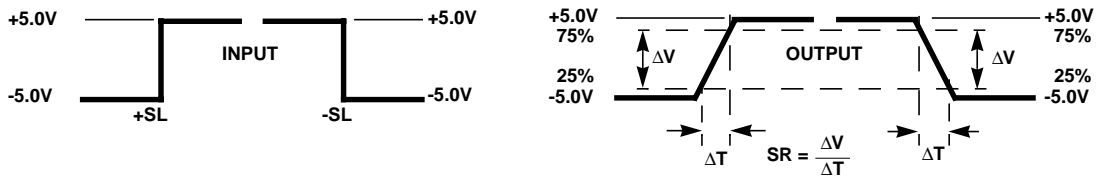
NOTE: For Detailed Information, Refer to HS-2600RH Test Technical Brief.

Test Waveforms

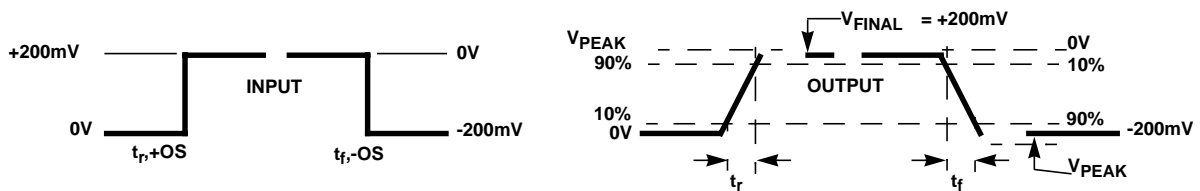
SIMPLIFIED TEST CIRCUIT



SLEW RATE WAVEFORMS

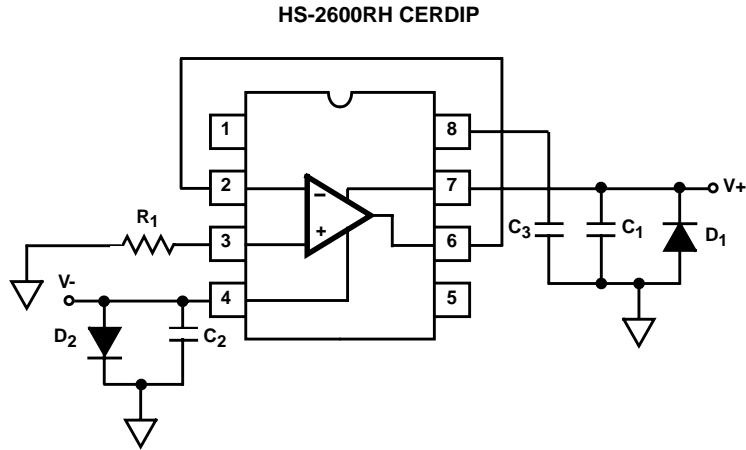


OVERSHOOT, RISE AND FALL TIME WAVE FORMS



NOTE: Measured on both positive and negative transitions. Capacitance at compensation pin should be minimized.

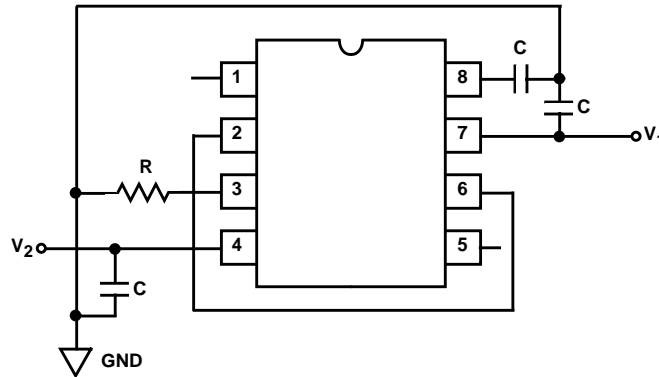
**Burn-In Circuit**



NOTES:

1.  $R_1 = 1M\Omega, \pm 5\%, 1/4W$  (Min)
2.  $C_1 = C_2 = 0.01\mu F/\text{Socket}$  (Min) or  $0.1\mu F/\text{Row}$  (Min)
3.  $C_3 = 0.01\mu F/\text{Socket}$  (10%)
4.  $D_1 = D_2 = \text{IN4002}$  or Equivalent/Board
5.  $|(V+) - (V-)| = 30V$

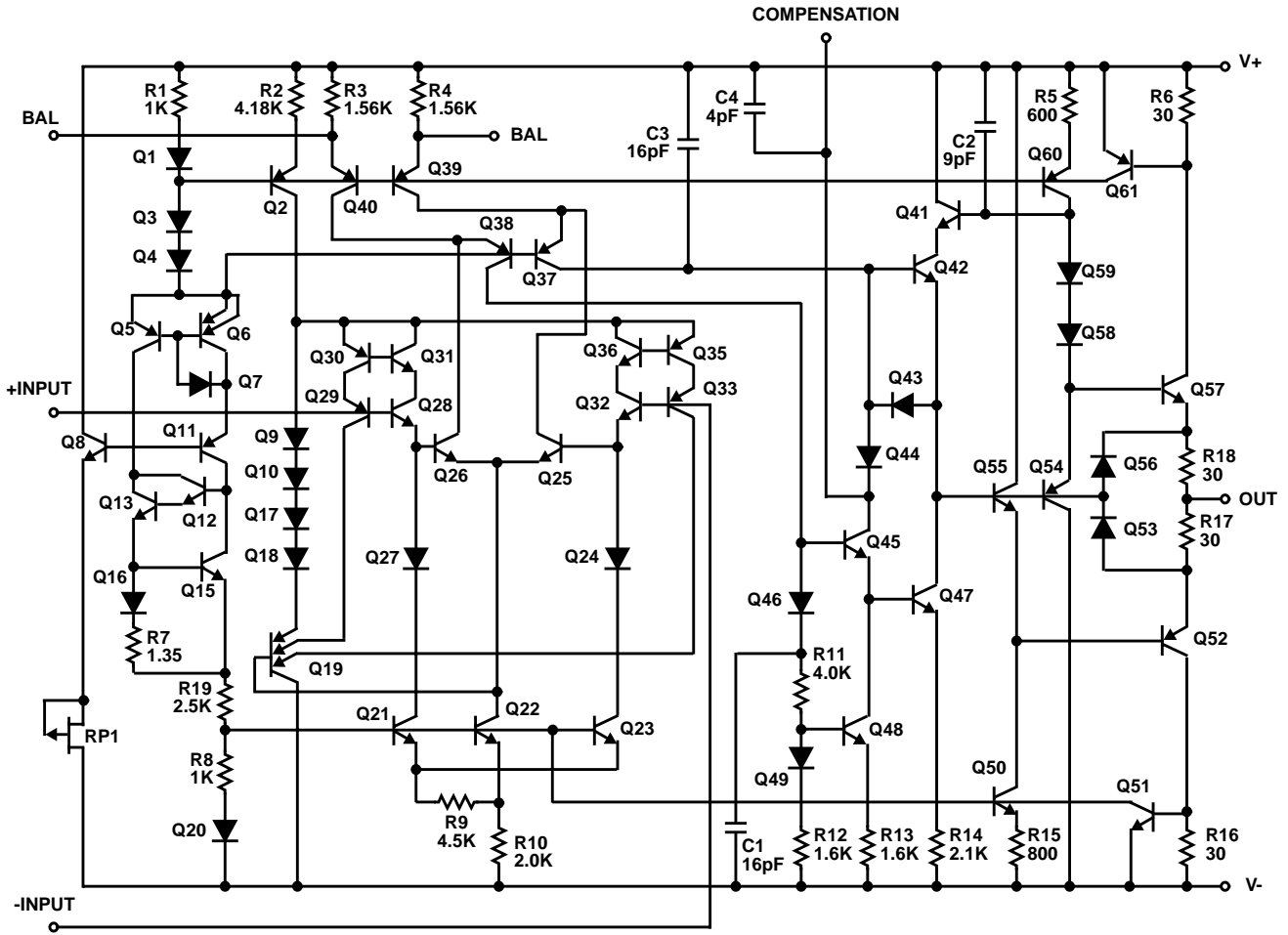
**Irradiation Circuit**



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 (Si<sub>3</sub>N<sub>4</sub>) over Silox (SiO<sub>2</sub>, 5% Phos.)  
 Silox Thickness: 12kÅ ±2kÅ  
 Nitride Thickness: 3.5kÅ ±1.5kÅ

**Top Metallization:**

Type: Al, 1% Cu  
 Thickness: 16kÅ ±2kÅ

**Substrate:**

Linear Bipolar DI

**Backside Finish:**

Silicon

**ASSEMBLY RELATED INFORMATION:**

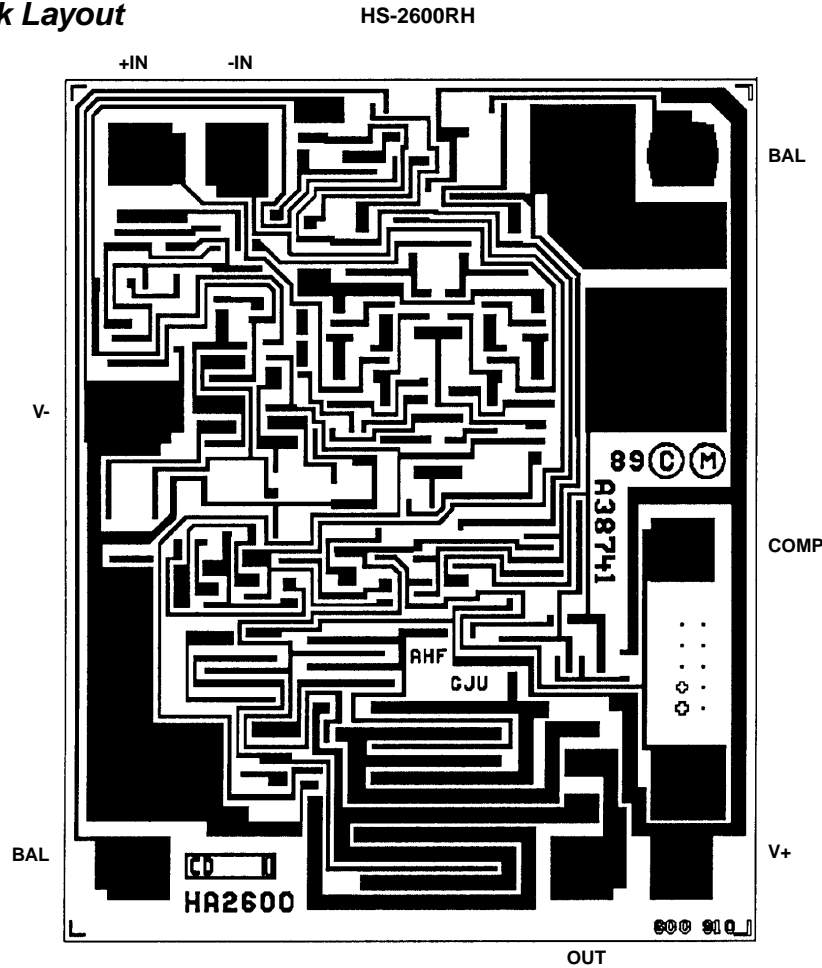
**Substrate Potential (Powered Up):**  
 Unbiased

**ADDITIONAL INFORMATION:**

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

**Transistor Count:**  
 140

**Metallization Mask Layout**



All Intersil semiconductor products are manufactured, assembled and tested under ISO9000 quality systems certification.

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