

## Radiation Hardened Quad Voltage Comparator

The Radiation Hardened HS-139RH consists of four independent single or dual supply voltage comparators on a single monolithic substrate. The common mode input voltage range includes ground, even when operated from a single supply, and the low supply current makes these comparators suitable for low power applications. These types were designed to directly interface with TTL and CMOS.

The HS-139RH is fabricated on our dielectrically isolated Rad Hard Silicon Gate (RSG) process, which provides an immunity to Single Event Latch-up and the capability of highly reliable performance in any radiation environment.

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

**Detailed Electrical Specifications for the HS-139RH are contained in SMD 5962-98613. A "hot-link" is provided on our homepage with instructions for downloading. [www.intersil.com/spacedefense/newsafclasst.asp](http://www.intersil.com/spacedefense/newsafclasst.asp)**

## Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)
5962F9861301VCC	HS1-139RH-Q	-55 to 125
5962F9861301QCC	HS1-139RH-8	-55 to 125
HS1-139RH/Proto	HS1-139RH/Proto	-55 to 125
5962F9861301VXC	HS9-139RH-Q	-55 to 125
5962F9861301QXC	HS9-139RH-8	-55 to 125
HS9-139RH/Proto	HS9-139RH/Proto	-55 to 125

## Features

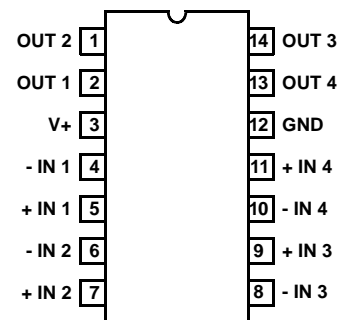
- QML Qualified Per MIL-PRF-38535 Requirements
- Radiation Environment
  - Latch-up Free Under any Conditions
  - Total Dose (Max) . . . . .  $3 \times 10^5$  RAD(Si)
  - SEU LET Threshold . . . . . 20MeV/cm<sup>2</sup>/mg
  - Low Dose Rate Effects Immunity
- 100V Output Voltage Withstand Capability
- ESD Protection to >3000V
- Differential Input Voltage Range Equal to the Supply Voltage
- Input Offset Voltage (V<sub>IO</sub>) . . . . . 2mV (Max)
- Quiescent Supply Current . . . . . 2mA (Max)

## Applications

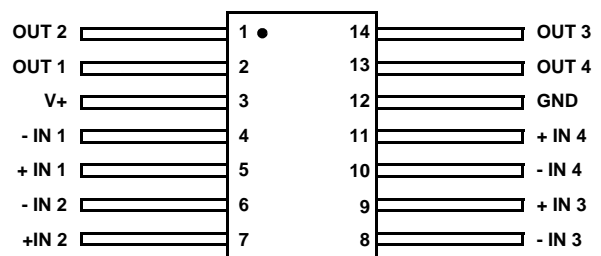
- Pulse Generators
- Timing Circuitry
- Level Shifting
- Analog to Digital Conversion

## Pinouts

**HS-139RH (SBDIP CDIP2-T14)**  
TOP VIEW



**HS-139RH (FLATPACK CDFP3-F14)**  
TOP VIEW



**Die Characteristics**

**DIE DIMENSIONS:**

3750µm x 2820µm (148 mils x 111 mils)  
 483µm ± 25.4µm (19 mils ± 1 mil)

**INTERFACE MATERIALS:**

**Glassivation:**

Type: Silox (SiO<sub>2</sub>)  
 Thickness: 8.0kÅ ± 1.0kÅ

**Top Metallization:**

Type: AlSiCu  
 Thickness: 16.0kÅ ± 2kÅ

**Substrate:**

Radiation Hardened Silicon Gate, Dielectric Isolation

**Backside Finish:**

Silicon

**ASSEMBLY RELATED INFORMATION:**

**Substrate Potential:**

Unbiased (DI)

**ADDITIONAL INFORMATION:**

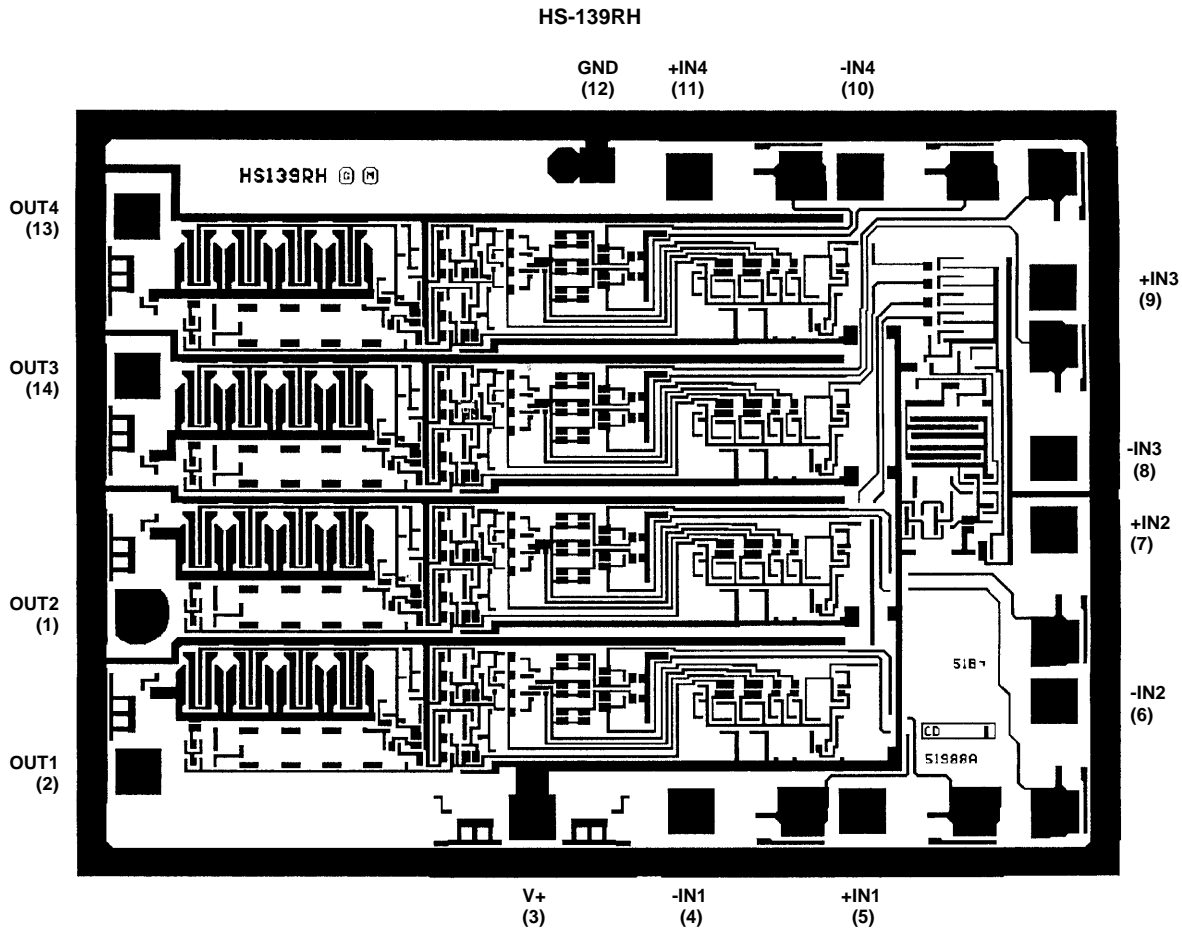
**Worst Case Current Density:**

<2.0 x 10<sup>5</sup> A/cm<sup>2</sup>

**Transistor Count:**

49

**Metallization Mask Layout**



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