

## 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)**

## 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 ( $V_{IO}$ ) . . . . . 2mV (Max)
- Quiescent Supply Current . . . . . 2mA (Max)
- Pb-Free (RoHS Compliant)

## Applications

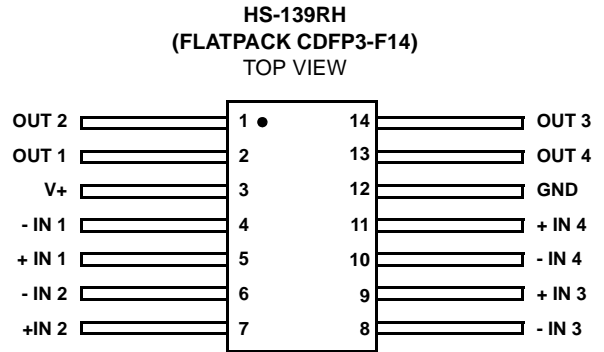
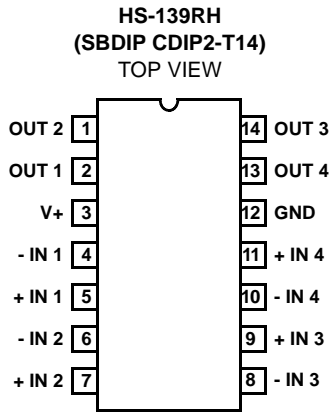
- Pulse Generators
- Timing Circuitry
- Level Shifting
- Analog to Digital Conversion

## Ordering Information

ORDERING NUMBER (Note)	INTERNAL MKT. NUMBER	PART MARKING	TEMP. RANGE (°C)	PACKAGE (Pb-Free)	PACKAGE DRAWING NUMBER
5962F9861301VCC	HS1-139RH-Q	Q 5962F98 61301VCC	-55 to +125	14 Ld SBDIP	D14.3
5962F9861301QCC	HS1-139RH-8	Q 5962F98 61301QCC	-55 to +125	14 Ld SBDIP	D14.3
HS1-139RH/PROTO	HS1-139RH/PROTO	HS1-139RH /PROTO	-55 to +125	14 Ld SBDIP	D14.3
5962F9861301VXC	HS9-139RH-Q	Q 5962F98 61301VXC	-55 to +125	14 Ld FLATPACK	K14.A
5962F9861301QXC	HS9-139RH-8	Q 5962F98 61301QXC	-55 to +125	14 Ld FLATPACK	K14.A
HS9-139RH/PROTO	HS9-139RH/PROTO	HS9-139RH /PROTO	-55 to +125	14 Ld FLATPACK	K14.A

NOTE: These Intersil Pb-free Hermetic packaged products employ 100% Au plate - e4 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations.

**Pinouts**



**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:**

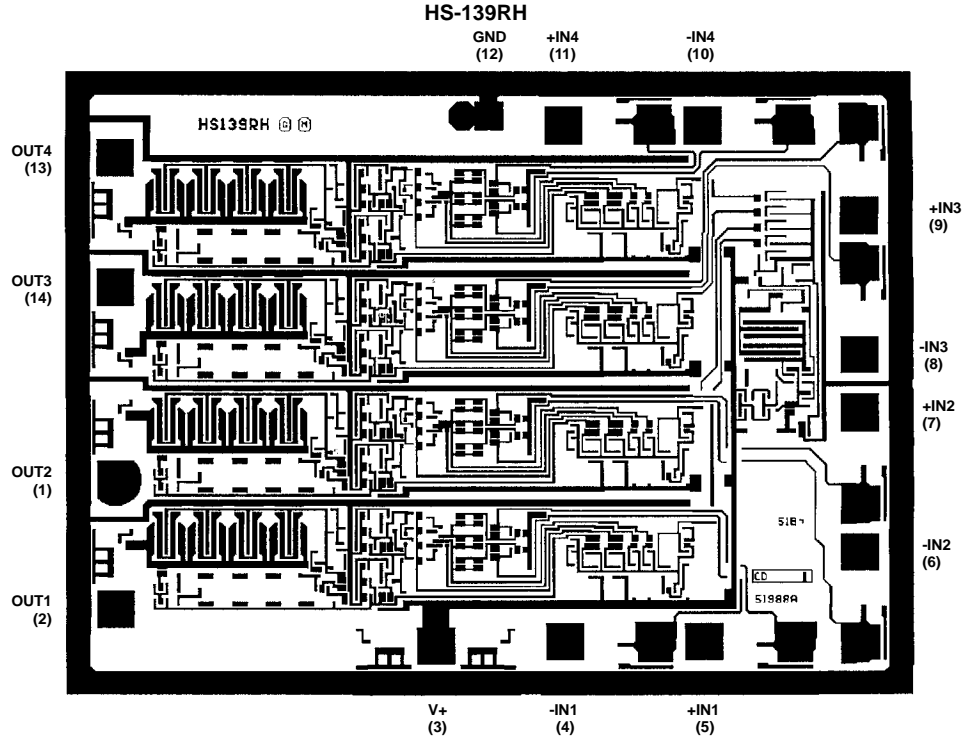
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For information regarding Intersil Corporation and its products, see [www.intersil.com](http://www.intersil.com)

**Metallization Mask Layout**



**TABLE 1. HS-139RH PAD COORDINATES**

PIN NUMBER	PAD NAME	RELATIVE TO PIN 1	
		X COORDINATES	Y COORDINATES
1	OUT 2	0	0
2	OUT 1	0	-535
3	V+	1323	-688
4	-IN 1	1862	-670
5	+IN 1	2439	-670
6	-IN 2	3084	-299
7	+IN 2	3084	278
8	-IN 3	3084	518
9	+IN 3	3084	1095
10	-IN 4	2439	1466
11	+IN 4	1862	1466
12	GND	1550	1503
13	OUT 4	0	1331
14	OUT 3	0	796

NOTE: Dimensions in microns