

**Radiation Hardened Quad Voltage Comparator**

Intersil's Satellite Applications Flow™ (SAF) devices are fully tested and guaranteed to 100kRAD total dose. These QML Class T devices are processed to a standard flow intended to meet the cost and shorter lead-time needs of large volume satellite manufacturers, while maintaining a high level of reliability.

The Radiation Hardened HS-139RH-T 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 make these comparators suitable for low power applications. These types were designed to directly interface with TTL and CMOS.

The HS-139RH-T 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**

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-T 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)

Intersil' Quality Management Plan (QM Plan), listing all Class T screening operations, is also available on our website.

[www.intersil.com/quality/manuals.asp](http://www.intersil.com/quality/manuals.asp)

**Ordering Information**

ORDERING NUMBER	PART NUMBER	TEMP. RANGE (°C)
5962R9861301TCC	HS1-139RH-T	-55 to 125
5962R9861301TXC	HS9-139RH-T	-55 to 125

**NOTE: Minimum order quantity for -T is 150 units through distribution, or 450 units direct.**

**Features**

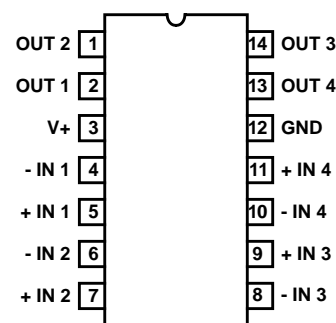
- QML Qualified Per MIL-PRF-38535 Requirements
- Radiation Environment
  - Latch-up Free Under Any Conditions
  - Total Dose . . . . .  $3 \times 10^5$  RAD(Si)
  - SEU LET . . . . . 20MEV/cm<sup>2</sup>/mg
- 100V Output Voltage Withstand Capability
- Differential Input Voltage Range Equal to the Supply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

**Applications**

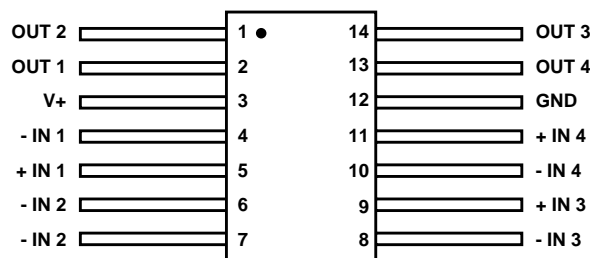
- Pulse Generators
- Timing Circuitry
- Level Shifting
- Analog to Digital Conversion

**Pinouts**

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



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



# HS-139RH-T

## Die Characteristics

### DIE DIMENSIONS:

3750 $\mu$ m x 2820 $\mu$ m (148 mils x 111 mils)  
483 $\mu$ m  $\pm$  25.4 $\mu$ m (19 mils  $\pm$  1 mil)

### INTERFACE MATERIALS

#### Glassivation

Type: Nitride (Si<sub>3</sub>N<sub>4</sub>) over Silox (SiO<sub>2</sub>)  
Nitride Thickness: 4.0kÅ +/- 0.5kÅ  
Silox Thickness: 12.0kÅ +/- 1.3kÅ

#### Top Metallization

Type: AL Si Cu  
Thickness: 16.0kÅ +/- 2kÅ

#### Substrate:

Radiation Hardened Silicon Gate,  
Dielectric Isolation

### Backside Finish:

Silicon

### ASSEMBLY RELATED INFORMATION

#### Substrate Potential:

Unbiased (DI)

### ADDITIONAL INFORMATION

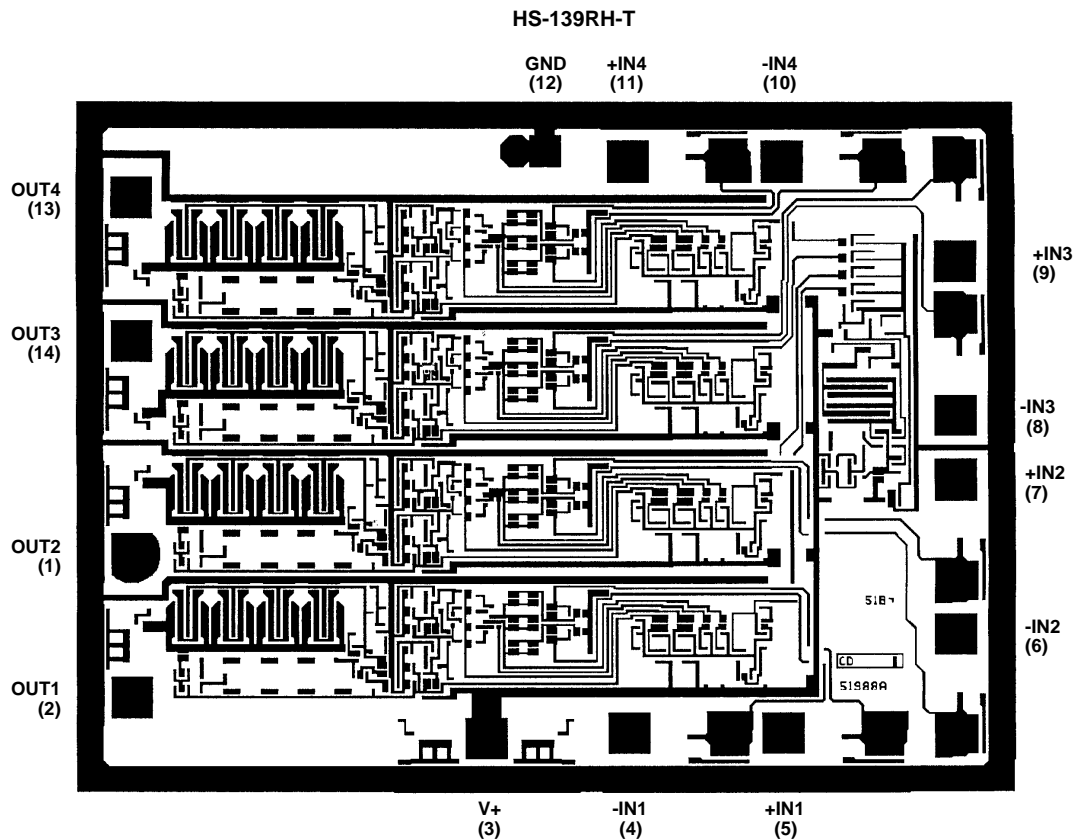
#### Worst Case Current Density:

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

#### Transistor Count:

49

## Metallization Mask Layout



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

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