Data Sheet | July 1999 | FN4646.1

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

Intersil' Quality Management Plan (QM Plan), listing all Class T screening operations, is also available on our website.
www.intersil.com/quality/manuals.asp

Ordering Information

ORDERING NUMBER	PART NUMBER	TEMP. RANGE (^oC)
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

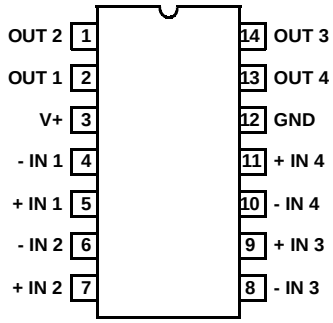
- QML Qualified Per MIL-PRF-38535 Requirements
- Radiation Environment
  - Latch-up Free Under Any Conditions
  - Total Dose . . . . . 3 x 10^5 RAD(Si)
  - SEU LET . . . . . 20MEV/cm^2/mg
- 100V Output Voltage Withstand Capability
- Differential Input Voltage Range Equal to the Supply Voltage
- Input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

Applications

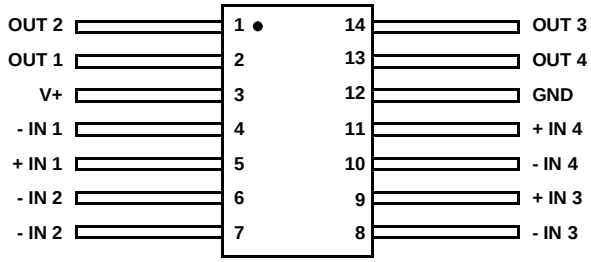
- Pulse Generators
- Timing Circuitry
- Level Shifting
- Analog to Digital Conversion

Pinouts

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



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



Die Characteristics

DIE DIMENSIONS:

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

INTERFACE MATERIALS

Glassivation

Type: Nitride (Si3N4) over Silox (SiO2
Nitride Thickness: 4.0kA +/- 0.5kA
Silox Thickness: 12.0kA +/- 1.3kA

Top Metallization

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

Substrate:

Radiation Hardened Silicon Gate,
Dielectric Isolation

Backside Finish:

Silicon

ASSEMBLY RELATED INFORMATION

Substrate Potential:

Unbiased (DI)

ADDITIONAL INFORMATION

Worst Case Current Density:

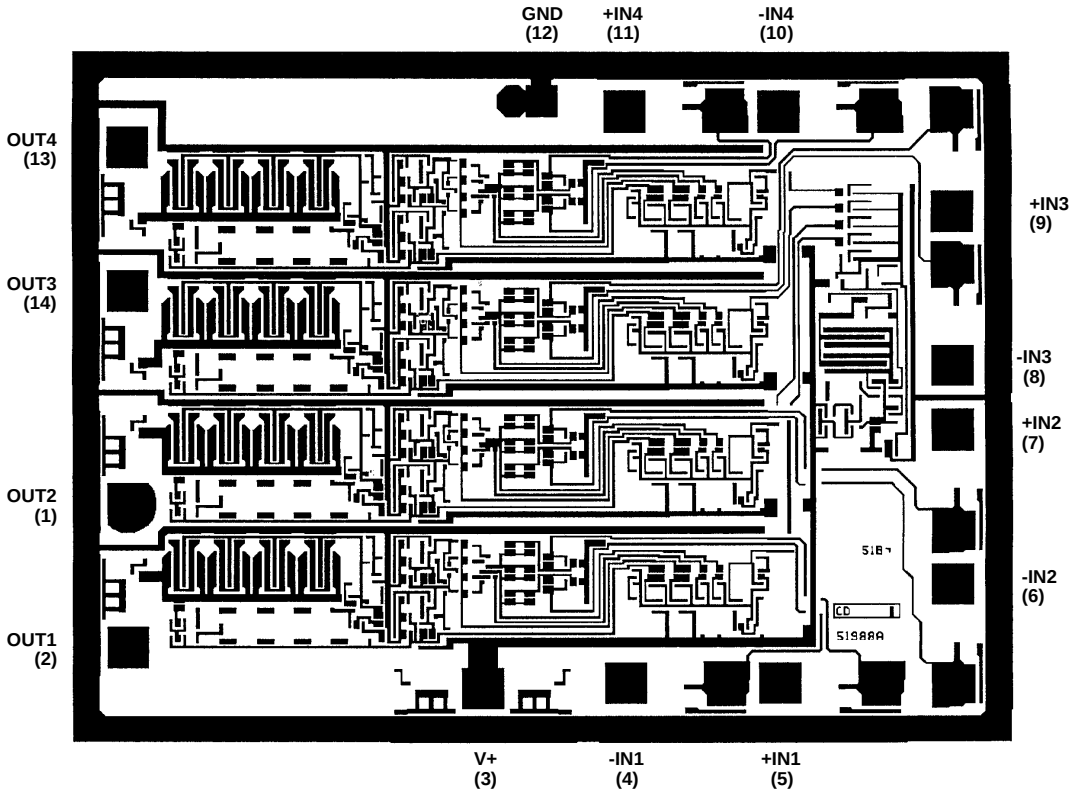
$<2.0 \times 10^5$ A/cm^2

Transistor Count:

49

Metallization Mask Layout

HS-139RH-T



All Intersil U.S. products are manufactured, assembled and tested utilizing ISO9000 quality systems.
Intersil Corporation's quality certifications can be viewed at www.intersil.com/design/quality