

## Radiation Hardened 8 Channel CMOS Analog Multiplexer with Overvoltage Protection

Intersil's Satellite Applications Flow™ (SAF) devices are fully tested and guaranteed to 100kRAD total dose. This QML Class T device is 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 HS-508ARH-T is a dielectrically isolated, radiation hardened, CMOS analog multiplexer incorporating an important feature; it withstands analog input voltages much greater than the supplies. This is essential in any system where the analog inputs originate outside the equipment. They can withstand a continuous input up to 10V greater than either supply, which eliminates the possibility of damage when supplies are off, but input signals are present. Equally important, it can withstand brief input transient spikes of several hundred volts; which otherwise would require complex external protection networks. Necessarily, ON resistance is somewhat higher than similar unprotected devices, but very low leakage current combine to produce low errors. Reference Application Notes 520 and 521, available from the Semiconductor Products Division of Intersil, for further information on the HS-508ARH-T multiplexer in general.

### 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-508ARH-T are contained in SMD 5962-96742.** A "hot-link" is provided from our website for downloading.

[www.intersil.com/spacedefense/newsafclasst.asp](http://www.intersil.com/spacedefense/newsafclasst.asp)

Intersil's 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)
5962R9674201TEC	HS1-508ARH-T	-55 to 125
5962R9674201TXC	HS9-508ARH-T	-55 to 125

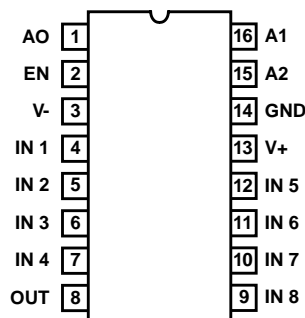
NOTE: **Minimum order quantity for -T is 150 units through distribution, or 450 units direct.**

### Features

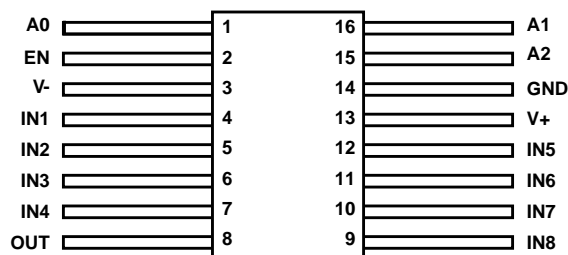
- QML Class T, Per MIL-PRF-38535
- Radiation Performance
  - Gamma Dose ( $\gamma$ )  $1 \times 10^5$  RAD(Si)
  - No Latch-Up, Dielectrically Isolated Device Islands
  - SEP LET > 110MeV/mg/cm<sup>2</sup>
- Analog/Digital Overvoltage Protection
- Fail Safe with Power Loss (No Latchup)
- Break-Before-Make Switching
- DTL/TTL and CMOS Compatible
- Analog Signal Range  $\pm 15V$
- Fast Access Time
- Supply Current at 1MHz Address Toggle (Typ) 4mA
- Standby Power (Typ.) 7.5mW

### Pinouts

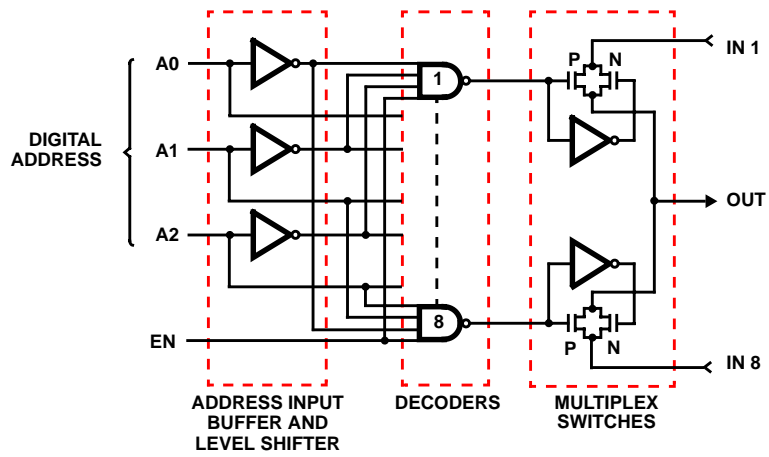
**HS1-508ARH-T (SBDIP), CDIP2-T16**  
TOP VIEW



**HS9-508ARH-T (FLATPACK), CDFP4-F16**  
TOP VIEW



Functional Diagram



TRUTH TABLE

A2	A1	A0	EN	"ON" CHANNEL
X	X	X	L	NONE
L	L	L	H	1
L	L	H	H	2
L	H	L	H	3
L	H	H	H	4
H	L	L	H	5
H	L	H	H	6
H	H	L	H	7
H	H	H	H	8

## Die Characteristics

### DIE DIMENSIONS:

(2108 $\mu$ m x 2743 $\mu$ m x 279 $\mu$ m  $\pm$ 25.4 $\mu$ m)  
83 x 108 x 11mils  $\pm$ 1mil

### METALLIZATION:

Type: Al Si  
Thickness: 12.5k $\text{\AA}$   $\pm$ 2k $\text{\AA}$

### SUBSTRATE POTENTIAL:

Unbiased (DI)

### BACKSIDE FINISH:

Silicon

### PASSIVATION:

Type: Silox (SiO<sub>2</sub>)  
Thickness: 8.0k $\text{\AA}$   $\pm$ 1.0k $\text{\AA}$

### WORST CASE CURRENT DENSITY:

6.68e4 A/cm<sup>2</sup>

### TRANSISTOR COUNT:

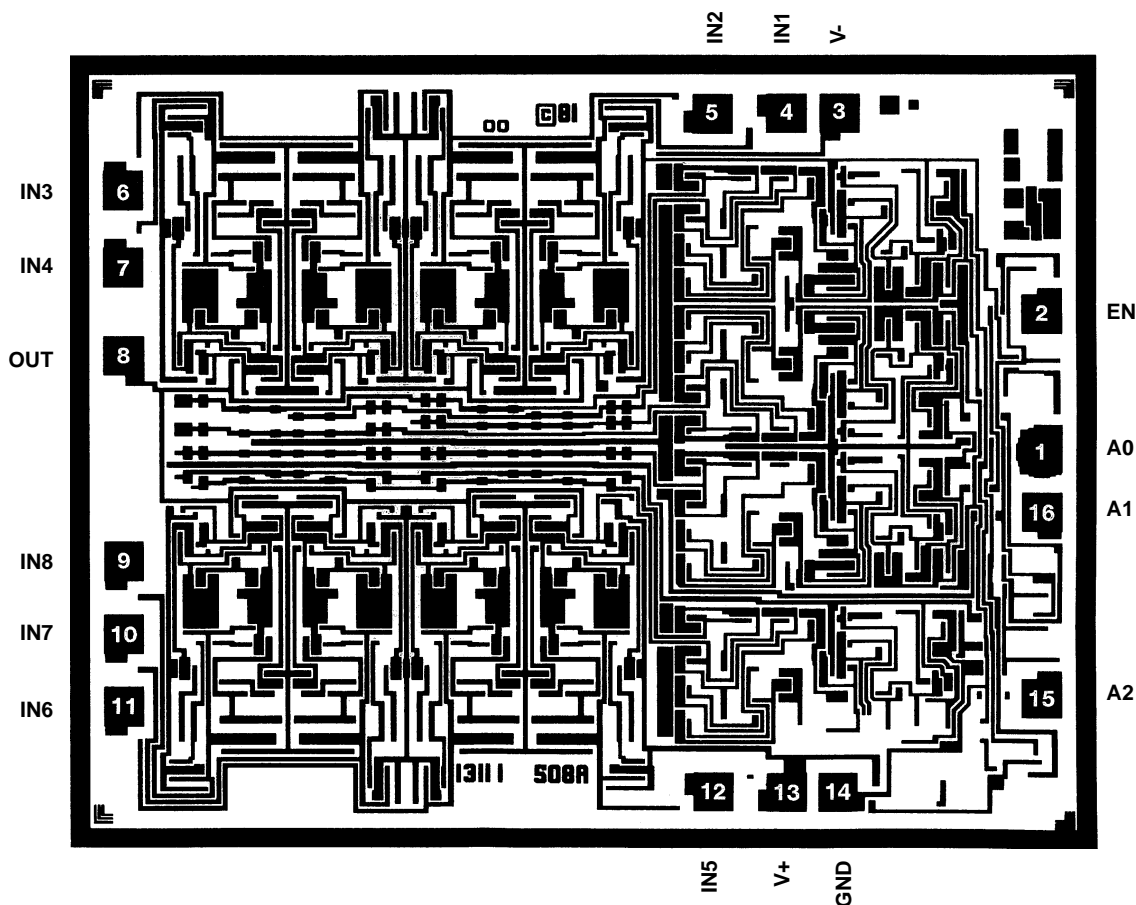
253

### PROCESS:

CMOS-DI

## Metallization Mask Layout

HS-508ARH-T



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

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