

Data Sheet

#### July 1999

## Radiation Hardened CMOS Dual DPST Analog Switch

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Intersil's Satellite Applications Flow<sup>™</sup> (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 HS-302RH-T analog switch is a monolithic device fabricated using Radiation Hardened CMOS technology and the Intersil dielectric isolation process for latch-up free operation. Improved total dose hardness is obtained by layout (thin oxide tabs extending to a channel stop) and processing (hardened gate oxide). These switches offer lowresistance switching performance for analog voltages up to the supply rails. "ON" resistance is low and stays reasonably constant over the full range of operating voltage and current. "ON" resistance also stays reasonably constant when exposed to radiation, being typically  $30\Omega$  pre-rad and  $35\Omega$ post 100kRAD(Si). This device provide break-before-make switching.

## 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-302RH-T are contained in SMD 5962-95812. A "hot-link" is provided from our website for downloading.

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/spacedefense/newsafclasst.asp

# **Ordering Information**

ORDERING NUMBER	PART NUMBER	TEMP. RANGE ( <sup>o</sup> C)	
5962R9581201TCC	HS1-302RH-T	-55 to 125	
5962R9581201TXC	HS9-302RH-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 (γ) 1 x 10<sup>5</sup> RAD(Si)
- No Latch-Up, Dielectrically Isolated Device Islands
- Pin for Pin Compatible with Intersil HI-302 Series Analog Switches
- Analog Signal Range 15V
- Low Leakage ..... 100nA (Max, Post Rad)
- Low Operating Power. . . . . . . 100μA (Max, Post Rad)

#### **Pinouts**





HS9-302RH-T (FLATPACK), CDFP3-F14 TOP VIEW



# Functional Diagram



TRUTH TABLE

LOGIC	ALL SWITCHES		
0	OFF		
1	ON		

# **Die Characteristics**

## DIE DIMENSIONS:

(2130μm x 1930μm x 279μm ±25.4μm) 84 x 76 x 11mils ±1mil

#### **METALLIZATION:**

Type: Al Thickness: 12.5kÅ ±2kÅ

## SUBSTRATE POTENTIAL:

Unbiased (DI)

## BACKSIDE FINISH:

Gold

# Metallization Mask Layout

## PASSIVATION:

Type: Silox (S<sub>i</sub>O<sub>2</sub>) Thickness: 8kÅ ±1kÅ

### WORST CASE CURRENT DENSITY:

< 2.0e5 A/cm<sup>2</sup>

#### TRANSISTOR COUNT:

76

## PROCESS:

Metal Gate CMOS, Dielectric Isolation



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# Device Information

## HS-302RH

#### Printer Friendly Version

Rad-Hard CMOS Dual DPST Analog Switch

DS Datasheets,	Description	<u>Key</u>	PT Parametric	Related
Related Docs		Features	<u>Data</u>	<u>Devices</u>
& Simulations				

#### **Ordering Information**



Part No	Design- In Status	Temn	Package	MSI	SMD	Price	
T dittito:	otatao	romp.	ruonugo	MOL		00 4	
HS0-302RH-Q	Active	Mil	<u>Die (Military</u> <u>Visual)</u>	N/A	-	Contact Us	Buy
HS1-302RH-8 🔁	Active	-	<u>14 Ld SBDIP</u>	N/A	5962R9581201QCC	Contact Us	Buy
HS1-302RH-Q	Active	-	<u>14 Ld SBDIP</u>	N/A	5962R9581201VCC	Contact Us	Buy
HS9-302RH-8 🔁	Active	-	14 Ld FlatPack	N/A	5962R9581201QXC	Contact Us	Buy
HS9-302RH-Q 🔁	Active	-	14 Ld FlatPack	N/A	5962R9581201VXC	Contact Us	Buy
HS1-302RH-T 🔁	InActive	-	<u>14 Ld SBDIP</u>	N/A	5962R9581201TCC	Contact Us	
HS9-302RH-T	InActive	-	14 Ld FlatPack	N/A	5962R9581201TXC	Contact Us	

The price listed is the manufacturer's suggested retail price for quantities between 100 and 999 units. However, prices in today's market are fluid and may change without notice.

**MSL =** Moisture Sensitivity Level - per IPC/JEDEC J-STD-020

SMD = Standard Microcircuit Drawing

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  - Analog Signal Range 15V
  - Low Leakage 100nA (Max, Post Rad)
- Low RON 60Ω (Max, Post Rad)
- Low Operating Power 100µA (Max, Post Rad)

