Data Sheet | December 14, 2006 | FN6411.0

Radiation Hardened CMOS Dual SPDT Analog Switch

The HS-303ARH analog switch is a monolithic device fabricated using Intersil's dielectrically isolated Radiation Hardened Silicon Gate (RSG) process technology to insure latch-up free operation. It is pinout compatible and functionally equivalent to the HS-303RH, but offers improved 300kRAD(Si) total dose capability. This switch offers low-resistance 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 29Ω pre-rad and 34Ω post-300kRAD(Si). Break-before-make switching is controlled by 5V digital inputs.

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-303ARH are contained in SMD 5962-95813. A "hot-link" is provided from our website for downloading

Ordering Information

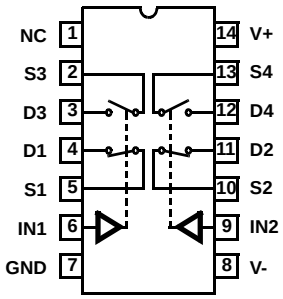
ORDERING NUMBER	PART NUMBER	TEMP. RANGE (°C)	PKG.	PKG. DWG. #
5962F9581304QCC	HS1-303ARH-8	-55 to +125	14 LD SBDIP	D14.3
5962F9581304QXC	HS9-303ARH-8	-55 to +125	14 LD Flatpack	K14.A
5962F9581304V9A	HS0-303ARH-Q	-55 to +125		
5962F9581304VCC	HS1-303ARH-Q	-55 to +125	14 LD SBDIP	D14.3
5962F9581304VXC	HS9-303ARH-Q	-55 to +125	14 LD Flatpack	K14.A
HS0-303ARH/PROTO	HS0-303ARH/SAMPLE	-55 to +125		
HS1-303ARH/PROTO	HS1-303ARH/PROTO	-55 to +125	14 LD SBDIP	D14.3
HS9-303ARH/PROTO	HS9-303ARH/PROTO	-55 to +125	14 LD Flatpack	K14.A

Features

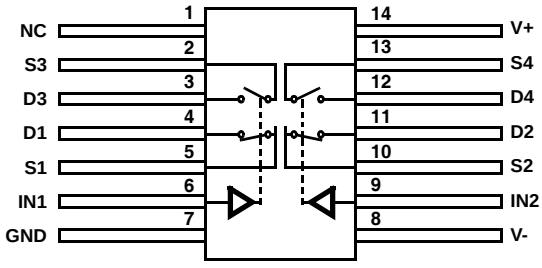
- QML, Per MIL-PRF-38535
- Radiation Performance
  - Total Dose: 3 x 10^5 RAD(Si)
  - SEE: For LET = 60MeV-mg/cm^2 at 60° Incident Angle, <150pC Charge Transferred to the Output of an Off Switch
- No Latch-Up, Dielectrically Isolated Device Islands
- Pinout and Functionally Compatible with Intersil HS-303RH and HI-303 Series Analog Switches
- Analog Signal Range 15V
- Low Leakage . . . . . 100nA (Max, Post-Rad)
- Low r_{ON} . . . . . 60Ω (Max, Post-Rad)
- Low Standby Supply Current . . . . . +150μA/-100μA (Max, Post-Rad)

Pinouts

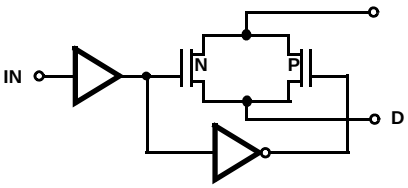
HS1-303ARH (SBDIP), CDIP2-T14
TOP VIEW



HS9-303ARH (FLATPACK) CDFP3-F14
TOP VIEW



Functional Diagram



SBDIP TRUTH TABLE

LOGIC	SW1 AND SW2	SW3 AND SW4
0	OFF	ON
1	ON	OFF

Die Characteristics

DIE DIMENSIONS:

2690µm x 5200µm (106 mils x 205 mils)
Thickness: 483µm ± 25.4µm (19 mils ± 1 mil)

INTERFACE MATERIALS:

Glassivation:

Type: PSG (Phosphorous Silicon Glass)
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:

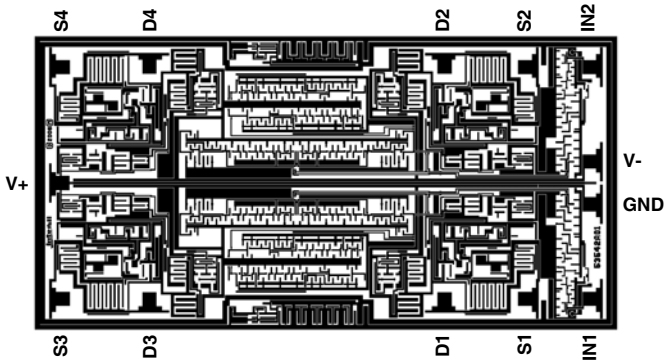
$<2.0 \times 10^5$ A/cm^2

Transistor Count:

196

Metallization Mask Layout

HS-303ARH



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Intersil Corporation's quality certifications can be viewed at www.intersil.com/design/quality