

November 1997

**Features**

- QML Qualified Per MIL-PRF-38535 Requirements
- 1.25Micron Radiation Hardened SOS CMOS
- Radiation Environment
  - Latch-up Free Under any Conditions
  - Total Dose . . . . .  $3 \times 10^5$  RAD(Si)
  - SEU Immunity . . . . .  $<1 \times 10^{-10}$  Errors/Bit/Day
  - SEU LET Threshold . . . . .  $>100\text{MeV}/(\text{mg}/\text{cm}^2)$
- Input Logic Levels . . .  $V_{IL} = (0.3)(V_{CC})$ ,  $V_{IH} = (0.7)(V_{CC})$
- Output Current . . . . .  $\pm 8\text{mA}$
- Quiescent Supply Current . . . . .  $400\mu\text{s}$
- Propagation Delay
  - Enable to Output . . . . . 12ns
  - Input or Address to Output . . . . . 15ns

**Applications**

- Digital Channel Selection
- Data Routing
- High Frequency Switching

**Description**

The Radiation Hardened ACS253MS is a Dual 4-Channel Multiplexer having two common binary control inputs for selecting 1 of 4 data channels. All inputs and outputs are buffered and are designed for balanced propagation delay and transition times.

Separate Output Enable inputs are provided to ease system design. When  $\overline{OE1}$  or  $\overline{OE2}$  are set HIGH, the corresponding output is configured into a high impedance state.

The ACS253MS is fabricated on a CMOS Silicon on Sapphire (SOS) process, which provides an immunity to Single Event Latch-up and the capability of highly reliable performance in any radiation environment. These devices offer significant power reduction and faster performance when compared to ALSTTL types.

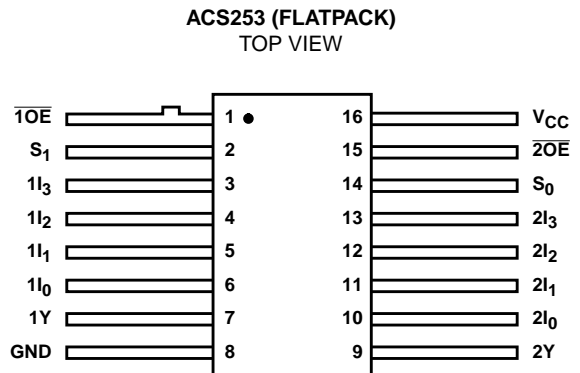
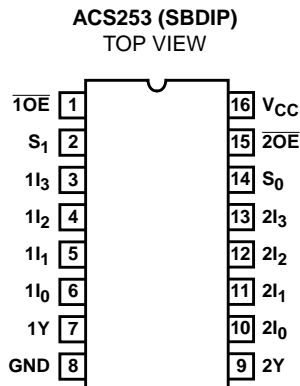
**Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed below must be used when ordering.**

Detailed Electrical Specifications for the ACS253 are contained in SMD 5962-98007. A "hot-link" is provided on our homepage with instructions for downloading. <http://www.intersil.com/data/sm/index.htm>

**Ordering Information**

SMD PART NUMBER	INTERSIL PART NUMBER	TEMP. RANGE (°C)	PACKAGE	CASE OUTLINE
5962F9800701VEC	ACS253DMSR-02	-55 to 125	16 Ld SBDIP	CDIP2-T16
N/A	ACS253D/Sample-02	25	16 Ld SBDIP	CDIP2-T16
5962F9800701VXC	ACS253KMSR-02	-55 to 125	16 Ld Flatpack	CDFP4-F16
N/A	ACS253K/Sample-02	25	16 Ld Flatpack	CDFP4-F16
N/A	ACS253HMSR-02	25	Die	N/A

**Pinouts**



# ACS253MS

## Die Characteristics

### DIE DIMENSIONS:

Size: 2390 $\mu$ m x 2390 $\mu$ m (94 mils x 94 mils)  
Thickness: 525 $\mu$ m  $\pm$ 25 $\mu$ m (20.6 mils  $\pm$ 1 mil)  
Bond Pad: 110 $\mu$ m x 110 $\mu$ m (4.3 mils x 4.3 mils)

### METALLIZATION:

Type: Al  
Metal 1 Thickness: 0.7 $\mu$ m  $\pm$ 0.1 $\mu$ m  
Metal 2 Thickness: 1.0 $\mu$ m  $\pm$ 0.1 $\mu$ m

### SUBSTRATE

Silicon on Sapphire (SOS)

### SUBSTRATE POTENTIAL:

Unbiased Insulator

### BACKSIDE FINISH:

Sapphire

### PASSIVATION:

Type: Phosphorous Silicon Glass (PSG)  
Thickness: 1.30 $\mu$ m  $\pm$ 0.15 $\mu$ m

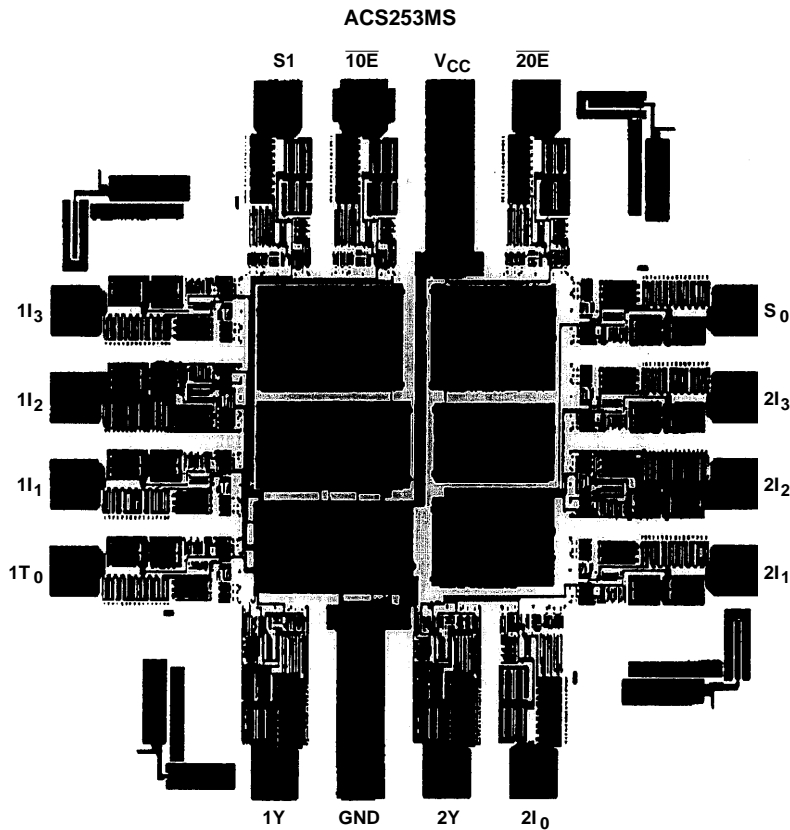
### SPECIAL INSTRUCTIONS:

Bond V<sub>CC</sub> First

### ADDITIONAL INFORMATION:

Worst Case Density: <2.0 x 10<sup>5</sup> A/cm<sup>2</sup>  
Transistor Count: 140

## Metallization Mask Layout



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

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