

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.

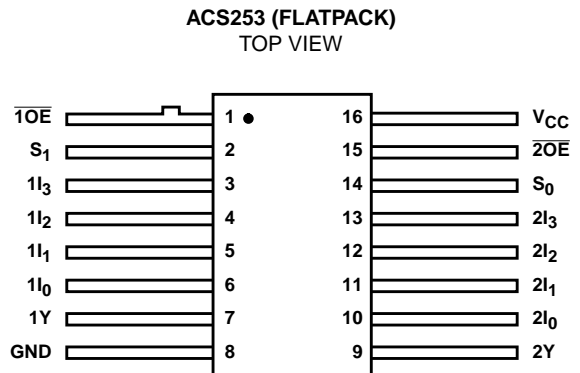
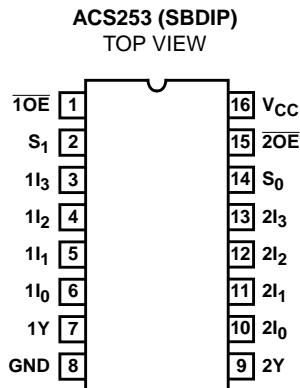
Specifications for Rad Hard QML devices are controlled by the Defense Supply Center in Columbus (DSCC). The SMD numbers listed below must be used when ordering.

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

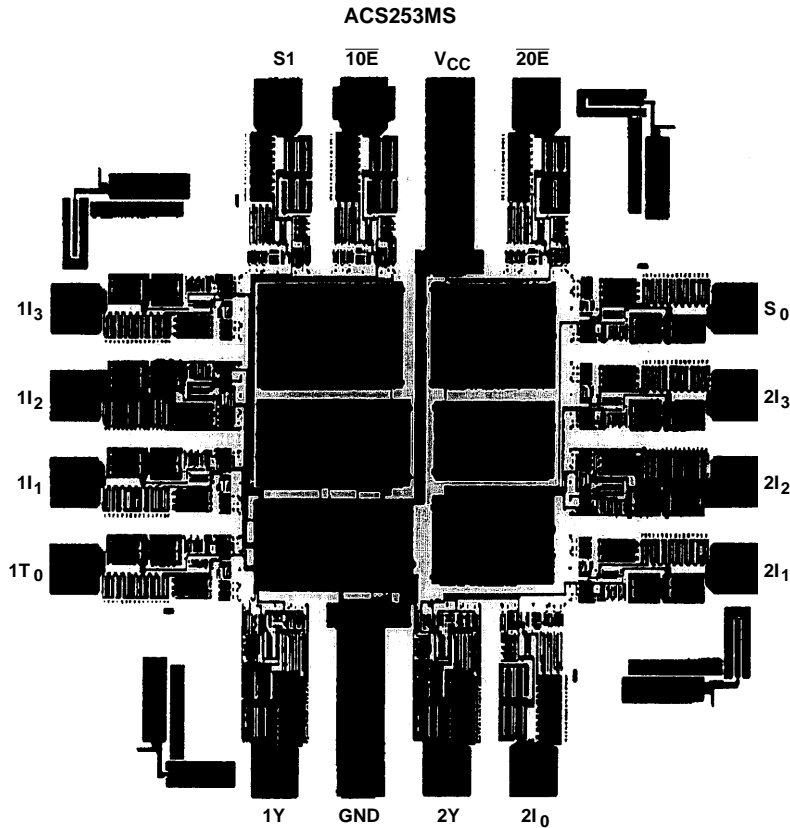
### SPECIAL INSTRUCTIONS:

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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