

**Radiation Hardened 10-to-4 Line Priority Encoder**

These nine-input priority encoders accept data from nine active LOW inputs and provide a binary representation on the four active LOW outputs. A priority is assigned to each input so that when two or more inputs are simultaneously active, the input with the highest priority is represented on the output. Input line I9 has the highest priority.

These devices provide the 10-to-4-line priority encoding function by use of the implied decimal “zero”. The “zero” is encoded when all nine data inputs are HIGH, forcing all four outputs HIGH.

The ACS147MS 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.

**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 ACS147MS are contained in SMD 5962-98633. A “hot-link” is provided on our homepage for downloading.**  
<http://www.intersil.com/spacedefense/spaceselect.htm>

**Features**

- QML Qualified Per MIL-PRF-38535 Requirements
- 1.25 Micron Radiation Hardened SOS CMOS
- Radiation Environment
  - Latch-Up Free Under Any Conditions
  - Total Dose (Max.) . . . . .  $3 \times 10^5$  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 . . . . .  $\pm 12\text{mA}$  (Min)
- Quiescent Supply Current . . . . .  $20\mu\text{A}$  (Max)
- Propagation Delay . . . . .  $17\text{ns}$  (Max)

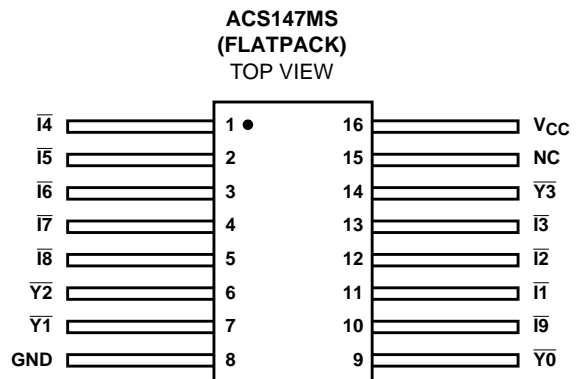
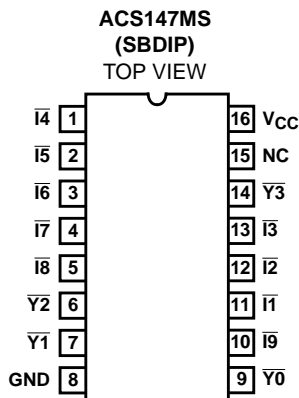
**Applications**

- High Speed Control Circuits
- Sensor Monitoring
- Low Power Designs

**Ordering Information**

ORDERING NUMBER	INTERNAL MARKETING NUMBER	TEMP. RANGE (°C)	PACKAGE	DESIGNATOR
5962F9863301VCC	ACS147DMSR-03	-55 to 125	16 Ld SBDIP	CDIP2-T16
ACS147D/SAMPLE-03	ACS147D/SAMPLE-03	25	16 Ld SBDIP	CDIP2-T16
5962F9863301VXC	ACS147KMSR-03	-55 to 125	16 Ld Flatpack	CDFP4-F16
ACS147K/SAMPLE-03	ACS147K/SAMPLE-03	25	16 Ld Flatpack	CDFP4-F16
5962F9863301V9A	ACS147HMSR-03	25	Die	NA

**Pinouts**



## 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 x 4.3 mils)

### METALLIZATION: 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 POTENTIAL

Unbiased Insulator

### PASSIVATION:

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

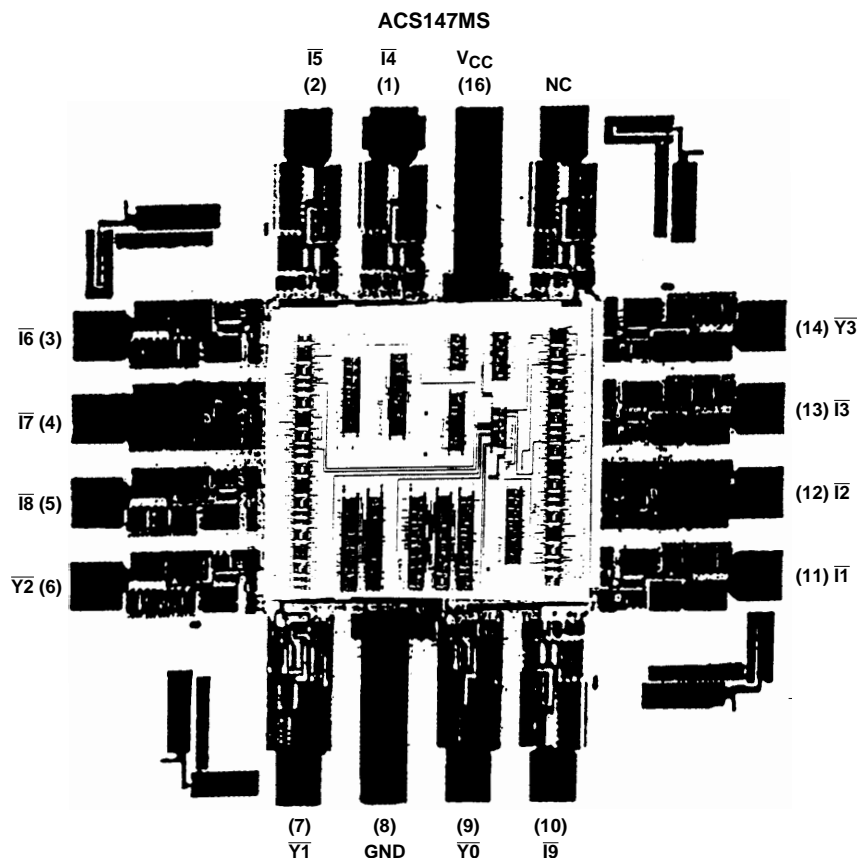
### SPECIAL INSTRUCTIONS

Bond V<sub>CC</sub> First

### ADDITIONAL INFORMATION:

Worst Case Current Density: <2.0 x 10<sup>5</sup> A/cm<sup>2</sup>  
 Transistor Count: 233

## Metallization Mask Layout



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

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