

## Radiation Hardened Hex Inverter with Open Drain Outputs

The Radiation Hardened ACS05MS is a Hex Inverter with open drain outputs. This device inverts a HIGH level on each input to a LOW level on the corresponding Y output. A LOW level on the input causes the corresponding Y output to enter a high impedance state, which can be pulled HIGH through a resistor to  $V_{CC}$ . All inputs are buffered and the outputs are designed for balanced propagation delay and transition times.

The ACS05MS 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 ACS05MS are contained in SMD 5962-98602. A "hot-link" is provided on our homepage with instructions for downloading.**  
[www.intersil.com/data/sm/index.asp](http://www.intersil.com/data/sm/index.asp)

## 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 . . . . .  $3 \times 10^5$  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 . . . . .  $\pm 8\text{mA}$  (Min)
- Quiescent Supply Current . . . . .  $100\mu\text{A}$  (Max)
- Propagation Delay . . . . . 20ns (Max)

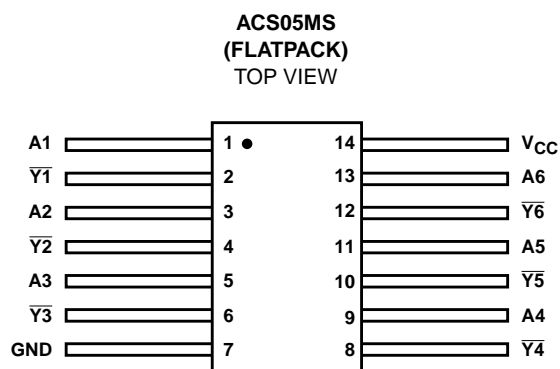
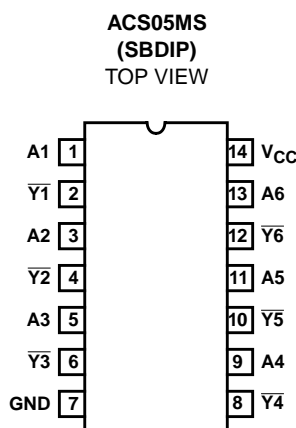
## Applications

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

## Ordering Information

ORDERING NUMBER	INTERNAL MKT. NUMBER	TEMP. RANGE (°C)	PACKAGE	DESIGNATOR
5962F9860201VCC	ACS05DMSR-03	-55 to 125	14 Ld SBDIP	CDIP2-T14
ACS05D/SAMPLE-03	ACS05D/SAMPLE-03	25	14 Ld SBDIP	CDIP2-T14
5962F9860201VXC	ACS05KMSR-03	-55 to 125	14 Ld Flatpack	CDFP4-F14
ACS05K/SAMPLE-03	ACS05K/SAMPLE-03	25	14 Ld Flatpack	CDFP4-F14
5962F9860201V9A	ACS05HMSR-03	25	Die	N/A

## 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:

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

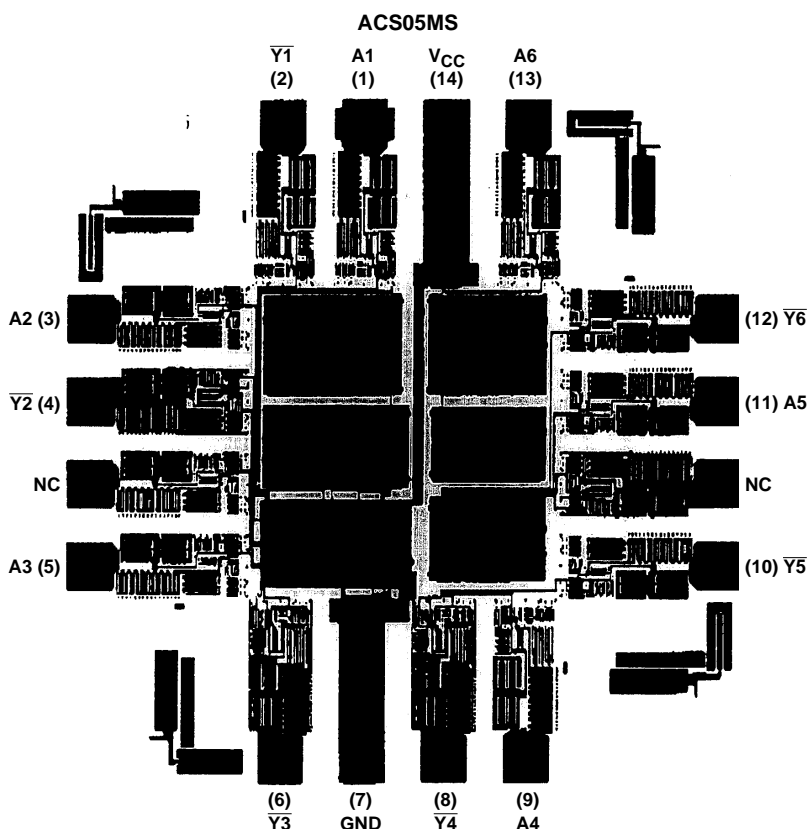
### SPECIAL INSTRUCTIONS:

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: 46

## Metallization Mask Layout



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