

## Radiation Hardened Quad 2-Input NAND Gate with Open Drain

January 1996

### Features

- Devices QML Qualified in Accordance with MIL-PRF-38535
- Detailed Electrical and Screening Requirements are Contained in SMD# 5962-96703 and Intersil's QM Plan
- 1.25 Micron Radiation Hardened SOS CMOS
- Total Dose ..... >300K RAD (Si)
- Single Event Upset (SEU) Immunity:  $<1 \times 10^{-10}$  Errors/Bit/Day (Typ)
- SEU LET Threshold ..... >100 MEV-cm<sup>2</sup>/mg
- Dose Rate Upset ..... > $10^{11}$  RAD (Si)/s, 20ns Pulse
- Dose Rate Survivability ..... > $10^{12}$  RAD (Si)/s, 20ns Pulse
- Latch-Up Free Under Any Conditions
- Military Temperature Range ..... -55°C to +125°C
- Significant Power Reduction Compared to ALSTTL Logic
- DC Operating Voltage Range ..... 4.5V to 5.5V
- Input Logic Levels
  - VIL = 30% of VCC Max
  - VIH = 70% of VCC Min
- Input Current  $\leq 1\mu\text{A}$  at VOL, VOH
- Fast Propagation Delay ..... 15ns (Max), 10ns (Typ)

### Description

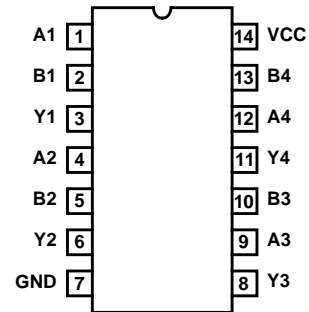
The Intersil ACS03MS is a Radiation Hardened quad 2-input NAND gate with open drain outputs. The open drain output can drive resistive loads from a separate supply voltage.

The ACS03MS utilizes advanced CMOS/SOS technology to achieve high-speed operation. This device is a member of a radiation hardened, high-speed, CMOS/SOS Logic Family.

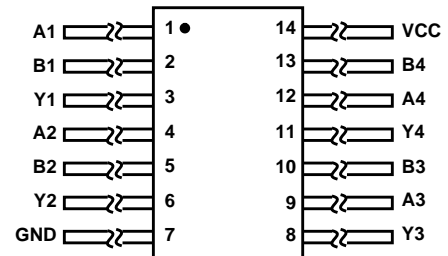
The ACS03MS is supplied in a 14 lead Ceramic Flatpack (K suffix) or a Ceramic Dual-In-Line Package (D suffix).

### Pinouts

14 PIN CERAMIC DUAL-IN-LINE  
MIL-STD-1835 DESIGNATOR CDIP2-T14,  
LEAD FINISH C  
TOP VIEW



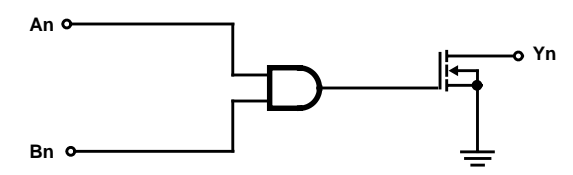
14 PIN CERAMIC FLATPACK  
MIL-STD-1835 DESIGNATOR CDFP3-F14,  
LEAD FINISH C  
TOP VIEW



### Ordering Information

PART NUMBER	TEMPERATURE RANGE	SCREENING LEVEL	PACKAGE
5962F9670301VCC	-55°C to +125°C	MIL-PRF-38535 Class V	14 Lead SBDIP
5962F9670301VXC	-55°C to +125°C	MIL-PRF-38535 Class V	14 Lead Ceramic Flatpack
ACS03D/Sample	25°C	Sample	14 Lead SBDIP
ACS03K/Sample	25°C	Sample	14 Lead Ceramic Flatpack
ACS03HMSR	25°C	Die	Die

Functional Diagram



TRUTH TABLE

INPUTS		OUTPUT
An	Bn	Yn
L	L	Z (Note 2), H (Note 3)
L	H	Z (Note 2), H (Note 3)
H	L	Z (Note 2), H (Note 3)
H	H	L

- NOTES:
- 1. L = Low, H = High, Z = High Impedance
  - 2. Without Pull-up Resistor
  - 3. With Pull-up Resistor

## Die Characteristics

### DIE DIMENSIONS:

68 mils x 79 mils  
1730mm x 2010mm

### METALLIZATION:

Type: AlSi  
Metal 1 Thickness:  $7.125\text{k}\text{\AA} \pm 1.125\text{k}\text{\AA}$   
Metal 2 Thickness:  $9\text{k}\text{\AA} \pm 1\text{k}\text{\AA}$

### GLASSIVATION:

Type:  $\text{SiO}_2$   
Thickness:  $8\text{k}\text{\AA} \pm 1\text{k}\text{\AA}$

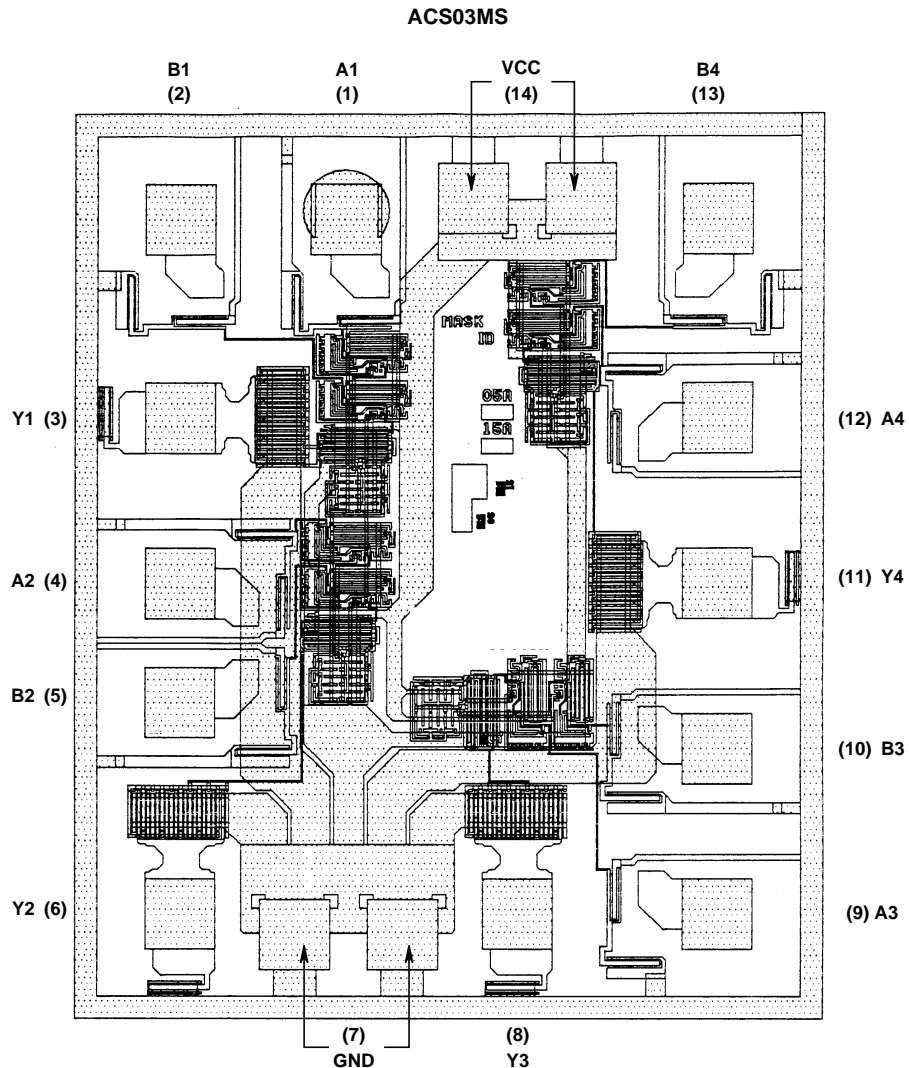
### WORST CASE CURRENT DENSITY:

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

### BOND PAD SIZE:

$110\mu\text{m} \times 110\mu\text{m}$   
4.3 mils x 4.3 mils

## Metallization Mask Layout



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