

Radiation Hardened 3-to-8 Line Decoder/Demultiplexer

December 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 3×10^5 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 ... $V_{IL} = (0.3V)(V_{CC})$, $V_{IH} = (0.7V)(V_{CC})$
- Output Current $\pm 12\text{mA}$
- Quiescent Supply Current $20\mu\text{A}$
- Propagation Delay 15ns

Applications

- Memory Decoding
- Data Routing
- Code Conversion

Description

The Radiation Hardened ACS138MS is an Inverting 3-to-8 Line Decoder/Demultiplexer with three binary select inputs (A_0 , A_1 and A_2). If the device is enabled, these inputs determine which one of the eight normally high outputs will go low.

Two active low and one active high enable inputs (\bar{E}_1 , \bar{E}_2 and E_3) are provided to make cascaded decoder designs easier to implement.

The ACS138MS 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.

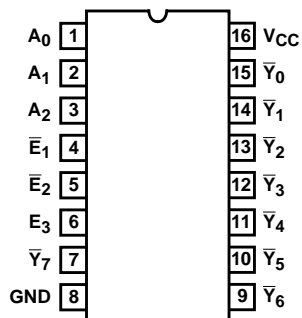
Detailed Electrical Specifications for the ACS138 are contained in SMD 5962-98534. A "hot-link" is provided on our homepage with instructions for downloading. <http://www.intersil.com/data/sm/index.htm>

Ordering Information

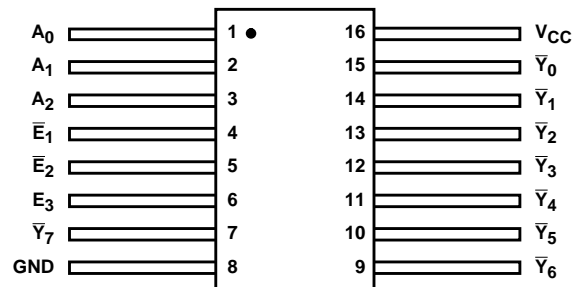
| SMD PART NUMBER | INTERSIL PART NUMBER | TEMP. RANGE (°C) | PACKAGE | CASE OUTLINE |
|-----------------|----------------------|------------------|----------------|--------------|
| 5962F9853401VEC | ACS138DMSR-02 | -55 to 125 | 16 Ld SBDIP | CDIP2-T16 |
| N/A | ACS138D/Sample-02 | 25 | 16 Ld SBDIP | CDIP2-T16 |
| 5962F9853401VXC | ACS138KMSR-02 | -55 to 125 | 16 Ld Flatpack | CDFP4-F16 |
| N/A | ACS138K/Sample-02 | 25 | 16 Ld Flatpack | CDFP4-F16 |
| N/A | ACS138HMSR-02 | 25 | Die | N/A |

Pinouts

ACS138 (SBDIP)
TOP VIEW



ACS138 (FLATPACK)
TOP VIEW



ACS138MS

Die Characteristics

DIE DIMENSIONS:

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

METALLIZATION: Al

Metal 1 Thickness: 0.7 μ m \pm 0.1 μ m
Metal 2 Thickness: 1.0 μ m \pm 0.1 μ m

SUBSTRATE POTENTIAL:

Unbiased Insulator

PASSIVATION

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

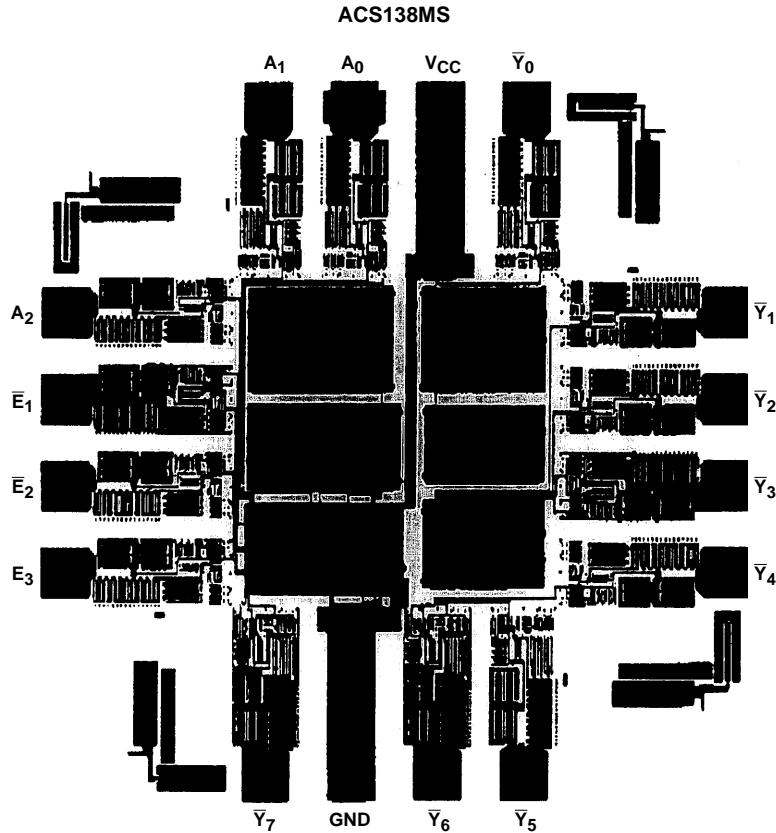
SPECIAL INSTRUCTIONS:

Bond V_{CC} First

ADDITIONAL INFORMATION:

Worst Case Density: <2.0 x 10⁵ A/cm²
Transistor Count: 220

Metallization Mask Layout



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

Intersil products are sold by description only. Intersil Corporation reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by Intersil is believed to be accurate and reliable. However, no responsibility is assumed by Intersil or its subsidiaries for its use; nor for any infringements of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Intersil or its subsidiaries.

For information regarding Intersil Corporation and its products, see web site <http://www.intersil.com>