ACS138MS

Radiation Hardened 3-to-8 Line Decoder/Demultiplexer

FN4461
Rev.0.00
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 x 10^5 RAD(Si)**
  - **SEU Immunity . . . . . <1 x 10^{-10} Errors/Bit/Day**
  - **SEU LET Threshold. . . . . >100MeV/(mg/cm^2)**
- **Input Logic Levels . . . V_{IL} = (0.3V)(V_{CC}), V_{IH} = (0.7V)(V_{CC})**
- **Output Current . . . . . ±12mA**
- **Quiescent Supply Current 20μA**
- **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 ($\overline{E}_1$, $\overline{E}_2$ 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.

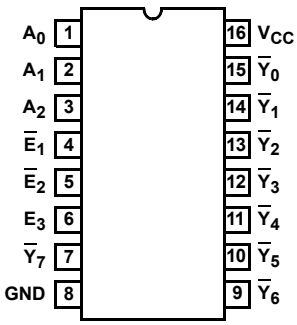
Detailed Electrical Specifications for the ACS138 are contained in SMD 5962-98534.

Ordering Information

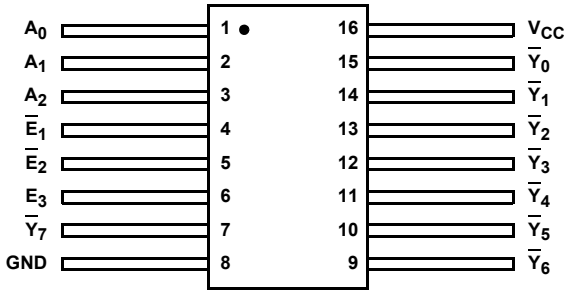
SMD PART NUMBER	INTERSIL PART NUMBER	TEMP. RANGE (^{o}C)	PACKAGE	CASE OUTLINE
5962F9853401VEC	ACS138DMSR-02	-55 to 125	16 Ld SBDIP	CDIP2-T16
N/A	ACS138D/Sample-02	25	16 Ld SBDIP	CDIP2-T16
5962F9853401VXC	ACS138KMSR-02	-55 to 125	16 Ld Flatpack	CDFP4-F16
N/A	ACS138K/Sample-02	25	16 Ld Flatpack	CDFP4-F16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

Pinouts

ACS138 (SBDIP)
TOP VIEW



ACS138 (FLATPACK)
TOP VIEW



Die Characteristics

DIE DIMENSIONS:

Size: 2390µm x 2390µm (94 mils x 94 mils)
Thickness: 525µm ±25µm (20.6 mils ±1 mil)
Bond Pad: 110µm x 110µm (4.3 x 4.3 mils)

METALLIZATION: Al
Metal 1 Thickness: 0.7µm ±0.1µm
Metal 2 Thickness: 1.0µm ±0.1µm

SUBSTRATE POTENTIAL:

Unbiased Insulator

PASSIVATION

Type: Phosphorous Silicon Glass (PSG)
Thickness: 1.30µm ±0.15µm

SPECIAL INSTRUCTIONS:

Bond V_{CC} First

ADDITIONAL INFORMATION:

Worst Case Density: $<2.0 \times 10^5$ A/cm^2
Transistor Count: 220

Metallization Mask Layout

ACS138MS