

**Radiation Hardened Hex D-Type Flip-Flop with Reset**

The Radiation Hardened ACS174MS is a Hex D-Type Flip-Flop with Reset. Information at the D input is transferred to the Q output on the positive-going transition of the clock. All six flip-flops are controlled by a common clock (CP) and a common reset (MR). Resetting is accomplished by a LOW level independent of the clock. All inputs are buffered and the outputs are designed for balanced propagation delay and transition times.

The ACS174MS 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 ACS174MS are contained in SMD 5962-98634. 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 . . . . .  $10\mu\text{A}$  (Max)
- Propagation Delay . . . . .  $.23\text{ns}$  (Max)

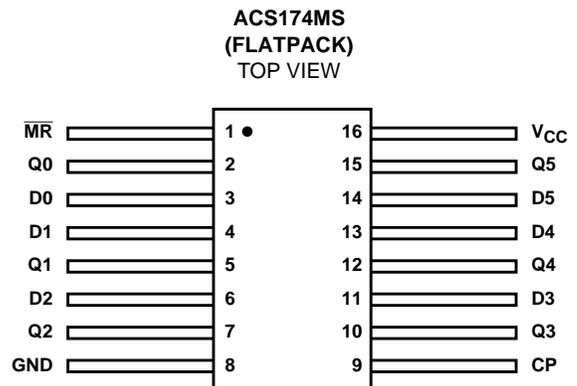
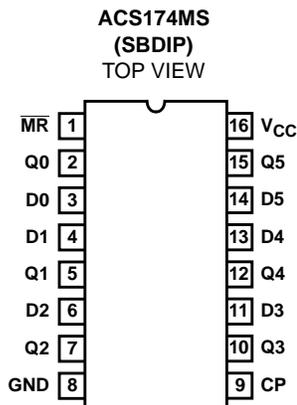
**Applications**

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

**Ordering Information**

ORDERING NUMBER	INTERNAL MARKETING NUMBER	TEMP. RANGE (°C)	PACKAGE	DESIGNATOR
5962F9863401VCC	ACS174DMSR-03	-55 to 125	16 Ld SBDIP	CDIP2-T16
ACS174D/SAMPLE-03	ACS174D/SAMPLE-03	25	16 Ld SBDIP	CDIP2-T16
5962F9863401VXC	ACS174KMSR-03	-55 to 125	16 Ld Flatpack	CDFP4-F16
ACS174K/SAMPLE-03	ACS174K/SAMPLE-03	25	16 Ld Flatpack	CDFP4-F16
5962F9863401V9A	ACS174HMSR-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

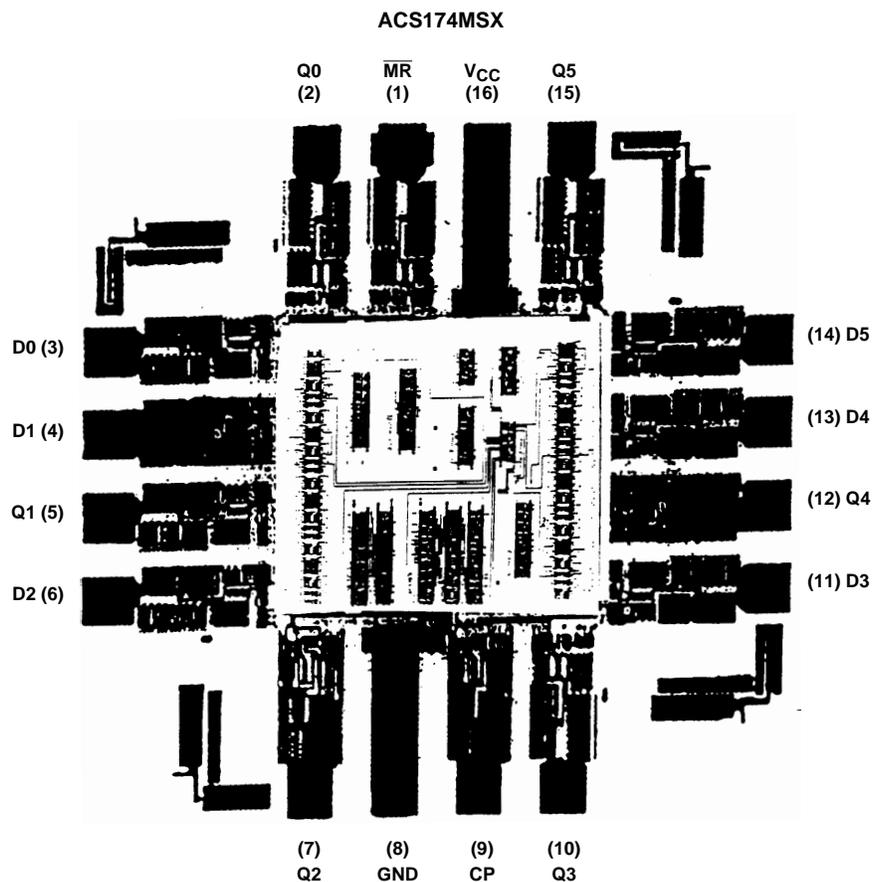
### SPECIAL INSTRUCTIONS

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: 358

## Metallization Mask Layout



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