

**Radiation Hardened Dual J-K Flip-Flop with Set and Reset**

The Radiation Hardened ACS109MS is a Dual J-K Flip-Flop with Set and Reset. These Flip-Flops have independent J,  $\bar{K}$ , Set, Reset, and Clock inputs and Q and  $\bar{Q}$  outputs. The outputs change state on the positive-going transition of the clock. Set and Reset are accomplished asynchronously by Low-level inputs. All inputs are buffered and the outputs are designed for balanced propagation delay and transition times.

The ACS109MS 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 ACS109MS are contained in SMD 5962-98632. 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 . . . . .  $.25\text{ns}$  (Max)

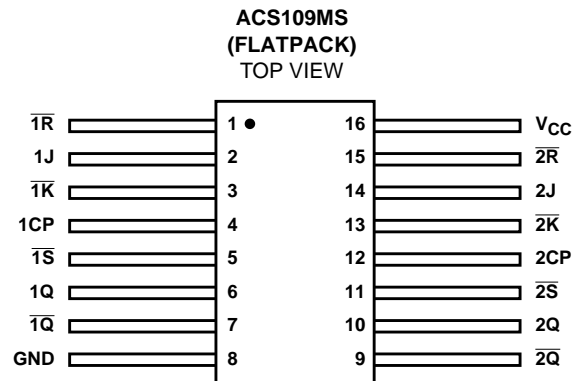
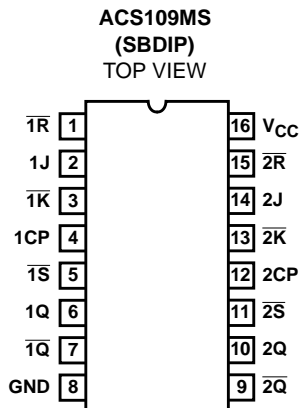
**Applications**

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

**Ordering Information**

ORDERING NUMBER	INTERNAL MARKETING NUMBER	TEMP. RANGE (°C)	PACKAGE	DESIGNATOR
5962F9863201VCC	ACS109DMSR-03	-55 to 125	16 Ld SBDIP	CDIP2-T16
ACS109D/SAMPLE-03	ACS109D/SAMPLE-03	25	16 Ld SBDIP	CDIP2-T16
5962F9863201VXC	ACS109KMSR-03	-55 to 125	16 Ld Flatpack	CDFP4-F16
ACS109K/SAMPLE-03	ACS109K/SAMPLE-03	25	16 Ld Flatpack	CDFP4-F16
5962F9863201V9A	ACS109HMSR-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

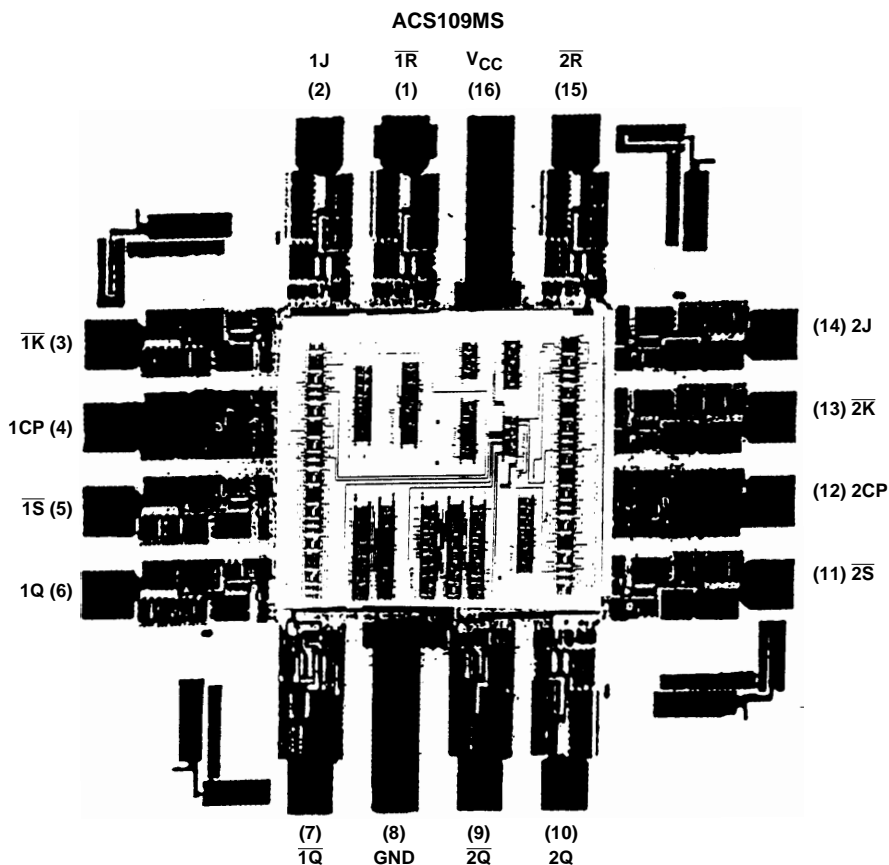
### SPECIAL INSTRUCTIONS

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: 236

## Metallization Mask Layout



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

*Intersil semiconductor 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 [www.intersil.com](http://www.intersil.com)

## Sales Office Headquarters

### NORTH AMERICA

Intersil Corporation  
 P. O. Box 883, Mail Stop 53-204  
 Melbourne, FL 32902  
 TEL: (321) 724-7000  
 FAX: (321) 724-7240

### EUROPE

Intersil SA  
 Mercure Center  
 100, Rue de la Fusee  
 1130 Brussels, Belgium  
 TEL: (32) 2.724.2111  
 FAX: (32) 2.724.22.05

### ASIA

Intersil (Taiwan) Ltd.  
 7F-6, No. 101 Fu Hsing North Road  
 Taipei, Taiwan  
 Republic of China  
 TEL: (886) 2 2716 9310  
 FAX: (886) 2 2715 3029