

**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)

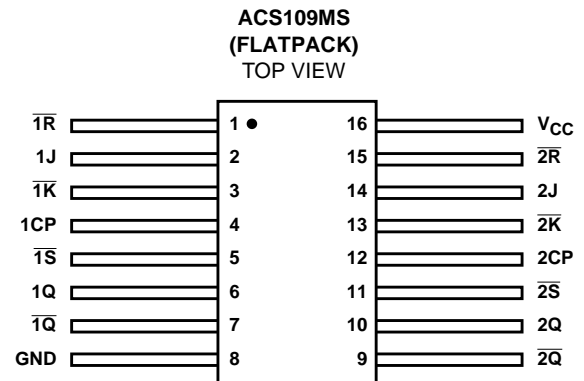
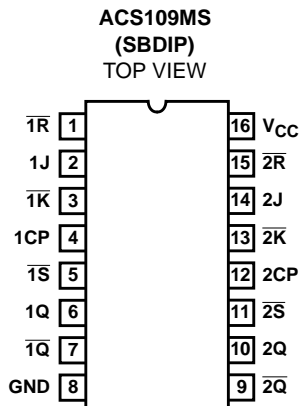
**Applications**

- 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: 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

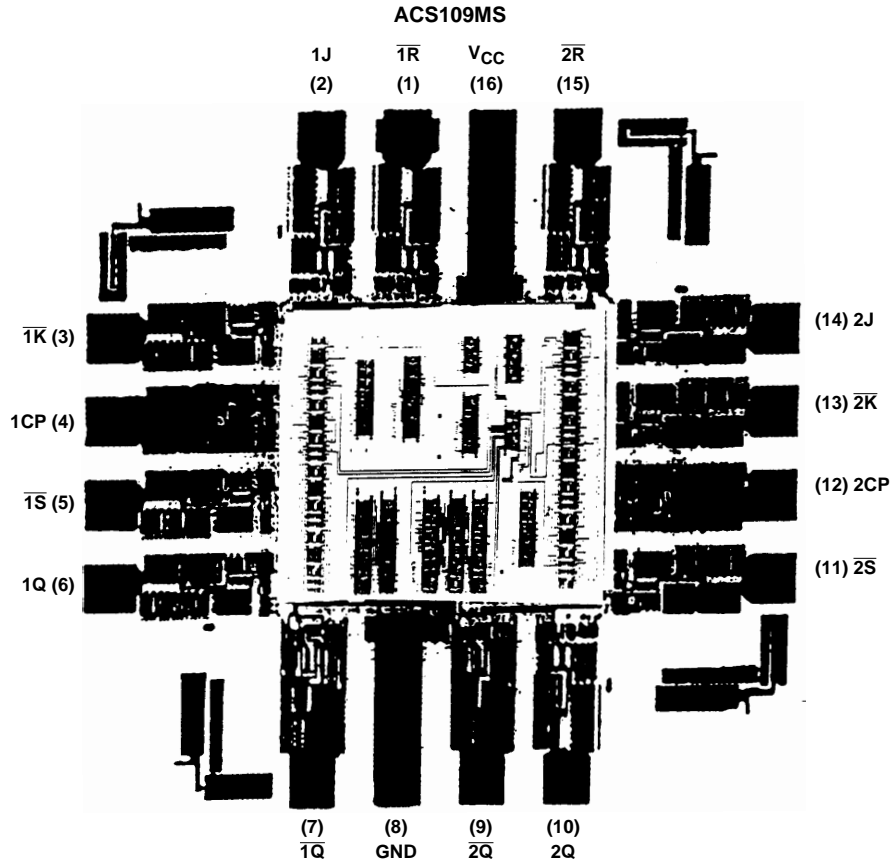
**SPECIAL INSTRUCTIONS**

Bond V<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.

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