ACTS74MS

Radiation Hardened Dual D Flip Flop with Set and Reset

January 1996

Features

- Devices QML Qualified in Accordance with MIL-PRFF-38535
- Detailed Electrical and Screening Requirements are Contained in SMD# 5962-96713 and Intersil's QM Plan
- 1.25 Micron Radiation Hardened SOS CMOS
- Total Dose . . . . . >300K RAD (Si)
- Single Event Upset (SEU) Immunity: <1 x 10^{-10} Errors/Bit/Day (Typ)
- SEU LET Threshold . . . . . >100 MEV-cm^2/mg
- Dose Rate Upset . . . . . >10^{11} RAD (Si)/s, 20ns Pulse
- Dose Rate Survivability . . . . . >10^{12} RAD (Si)/s, 20ns Pulse
- Latch-Up Free Under Any Conditions
- Military Temperature Range . . . . . -55°C to +125°C
- Significant Power Reduction Compared to ALSTTL Logic
- DC Operating Voltage Range . . . . . 4.5V to 5.5V
- Input Logic Levels
  - VIL = 0.8V Max
  - VIH = VCC/2 Min
- Input Current ≤ 1μA at VOL, VOH
- Fast Propagation Delay . . . . . 20ns (Max), 13ns (Typ)

Description

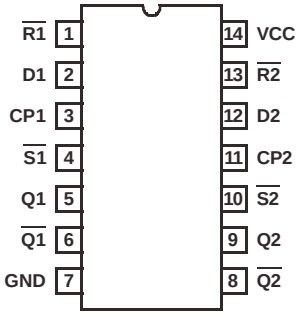
The Intersil ACTS74MS is a Radiation Hardened Dual D Flip Flop with Set(s) and Reset (R). The logic level at data input is transferred to the output during the positive transition of the clock. The Set and Reset are independent from the clock and accomplished by a low level on the appropriate input.

The ACTS74MS utilizes advanced CMOS/SOS technology to achieve high-speed operation. This device is a member of a radiation hardened, high-speed, CMOS/SOS Logic Family.

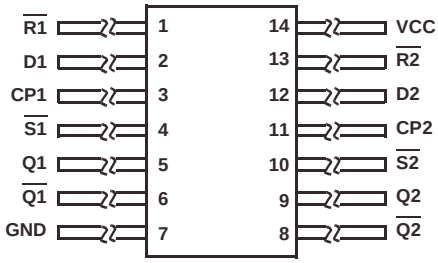
The ACTS74MS is supplied in a 14 lead Ceramic Flatpack (K suffix) or a 14 Lead Ceramic Dual-In-Line Package (D suffix).

Pinouts

14 PIN CERAMIC DUAL-IN-LINE
MIL-STD-1835 DESIGNATOR CDIP2-T14,
LEAD FINISH C
TOP VIEW



14 PIN CERAMIC FLATPACK
MIL-STD-1835 DESIGNATOR CDFP3-F14,
LEAD FINISH C
TOP VIEW

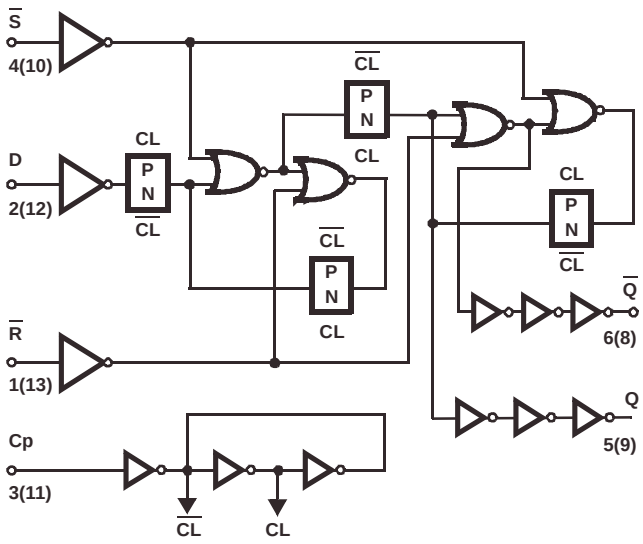


Ordering Information

PART NUMBER	TEMPERATURE RANGE	SCREENING LEVEL	PACKAGE
5962F9671301VCC	-55°C to +125°C	MIL-PRF-38535 Class V	14 Lead SBDIP
5962F9671301VXC	-55°C to +125°C	MIL-PRF-38535 Class V	14 Lead Ceramic Flatpack
ACTS74D/Sample	25°C	Sample	14 Lead SBDIP
ACTS74K/Sample	25°C	Sample	14 Lead Ceramic Flatpack
ACTS74HMSR	25°C	Die	Die

Spec Number **518787**
File Number **3382.1**

Functional Diagram



TRUTH TABLE

INPUTS				OUTPUTS	
$\overline{SET}$	$\overline{RESET}$	CP	D	Q	$\overline{Q}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H (Note 2)	H (Note 2)
H	H	⟋	H	H	L
H	H	⟋	L	L	H
H	H	L	X	Q0	$\overline{Q0}$

H = High Level (Steady State)
L = Low Level (Steady State)
X = Don't Care
⟋ = Transition from Low to High Level

NOTES:

1. Q0 = the level of Q before the indicated input conditions were established.
2. This configuration is nonstable, that is, it will not persist when set and reset inputs return to their inactive (high) level.

Die Characteristics

DIE DIMENSIONS:

88 mils x 88 mils
2240mm x 2240mm

METALLIZATION:

Type: AlSi
Metal 1 Thickness: 7.125kÅ ±1.125kÅ
Metal 2 Thickness: 9kÅ ±1kÅ

GLASSIVATION:

Type: SiO_2
Thickness: 8kÅ ±1kÅ

WORST CASE CURRENT DENSITY:

$<2.0 \times 10^5 A/cm^2$

BOND PAD SIZE:

110µm x 110µm
4.3 mils x 4.3 mils

Metallization Mask Layout

ACTS74MS