

Radiation Hardened Dual J-K Flip-Flop

January 1996

Features

- Devices QML Qualified in Accordance with MIL-PRF-38535
- Detailed Electrical and Screening Requirements are Contained in SMD# 5962-96714 and Harris' QM Plan
- 1.25 Micron Radiation Hardened SOS CMOS
- Total Dose >300K RAD (Si)
- Single Event Upset (SEU) Immunity: <math> < 1 \times 10^{-10}</math> Errors/Bit/Day (Typ)
- SEU LET Threshold >100 MEV-cm²/mg
- Dose Rate Upset >10¹¹ RAD (Si)/s, 20ns Pulse
- Dose Rate Survivability >10¹² 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 26ns (Max), 16ns (Typ)

Description

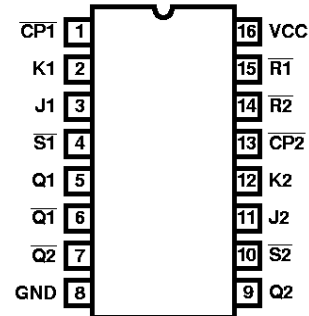
The Harris ACTS112MS is a Radiation Hardened Dual J-K Flip-Flop with Set and Reset. The output change states on the negative transition of the clock (CP1N or CP2N).

The ACTS112MS utilizes advanced CMOS/SOS technology to achieve high-speed operation. This device is a member of radiation hardened, high-speed, CMOS/SOS Logic Family.

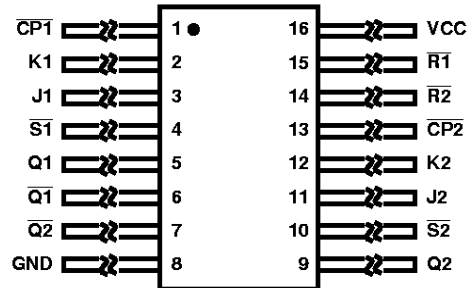
The ACTS112MS is supplied in a 16 lead Ceramic Flatpack (K suffix) or a Ceramic Dual-In-Line Package (D suffix).

Pinouts

16 PIN CERAMIC DUAL-IN-LINE
MIL-STD-1835, DESIGNATOR CDIP2-T16,
LEAD FINISH C
TOP VIEW



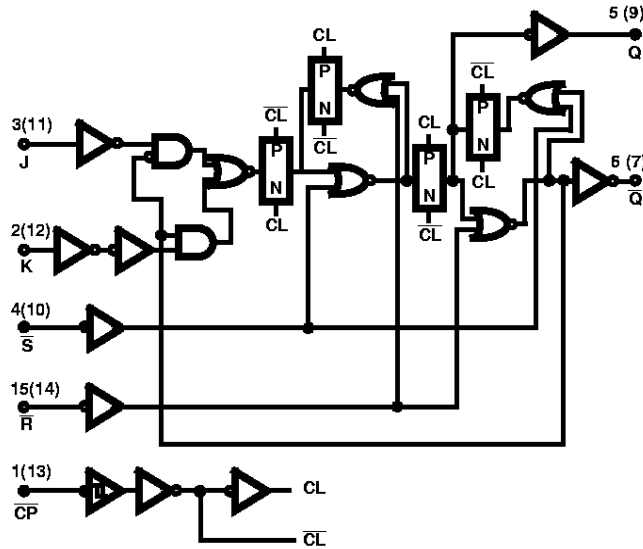
16 PIN CERAMIC FLATPACK
MIL-STD-1835, DESIGNATOR CDFP4-F16,
LEAD FINISH C
TOP VIEW



Ordering Information

PART NUMBER	TEMPERATURE RANGE	SCREENING LEVEL	PACKAGE
5962F9671401VEC	-55°C to +125°C	MIL-PRF-38535 Class V	16 Lead SBDIP
5962F9671401VXC	-55°C to +125°C	MIL-PRF-38535 Class V	16 Lead Ceramic Flatpack
ACTS112D/Sample	25°C	Sample	16 Lead SBDIP
ACTS112K/Sample	25°C	Sample	16 Lead Ceramic Flatpack
ACTS112HMSR	25°C	Die	Die

Functional Diagram



TRUTH TABLE

INPUTS					OUTPUTS	
S	R	CP	J	K	Q	Q̄
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H (Note 2)	H (Note 2)
H	H		L	L	No Change	
H	H		H	L	H	L
H	H		L	H	L	H
H	H		H	H	Toggle	
H	H	H	X	X	No Change	

NOTE:

1. H = High Steady State, L = Low Steady State, X = Immaterial, = High-to-Low Transition
2. Output States Unpredictable if S̄ and R̄ Go High Simultaneously after Both being Low at the Same Time

ACTS112MS

Die Characteristics

DIE DIMENSIONS:

88 mils x 88 mils
2.24mm x 2.24mm

METALLIZATION:

Type: AlSi
Metal 1 Thickness: $7.125k\text{\AA} \pm 1.125k\text{\AA}$
Metal 2 Thickness: $9k\text{\AA} \pm 1k\text{\AA}$

GLASSIVATION:

Type: SiO_2
Thickness: $8k\text{\AA} \pm 1k\text{\AA}$

WORST CASE CURRENT DENSITY:

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

BOND PAD SIZE:

$110\mu\text{m} \times 110\mu\text{m}$
4.3 mils x 4.3 mils

Metallization Mask Layout

