ACTS161MS

Radiation Hardened 4-Bit Synchronous Counter

January 1996

Features

- **Devices QML Qualified in Accordance with MIL-PRF-38535**
- **Detailed Electrical and Screening Requirements are Contained in SMD# 5962-96716 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 . . . . . 25ns (Max), 16ns (Typ)**

Description

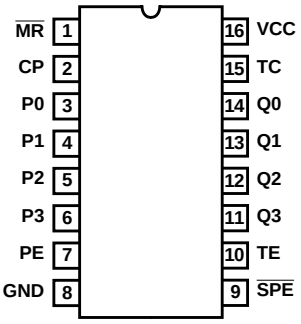
The Intersil ACTS161MS is a Radiation Hardened 4-Bit Binary Synchronous Counter, featuring asynchronous reset and load ahead carry logic. The $\overline{MR}$ is an active low master reset. $\overline{SPE}$ is an active low Synchronous Parallel Enable which disables counting and allows data at the preset inputs (P0 - P3) to load the counter. CP is the positive edge clock. TC is the terminal count or carry output. Both TE and PE must be high for counting to occur, but are irrelevant to loading. TE low will keep TC low.

The ACTS161MS 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.

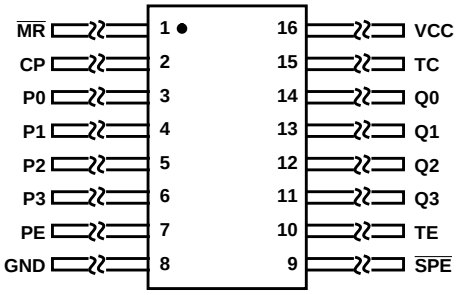
The ACTS161MS is supplied in a 16 lead Ceramic Flatpack (K suffix) or a Ceramic Dual-In-Line Package (D suffix).

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



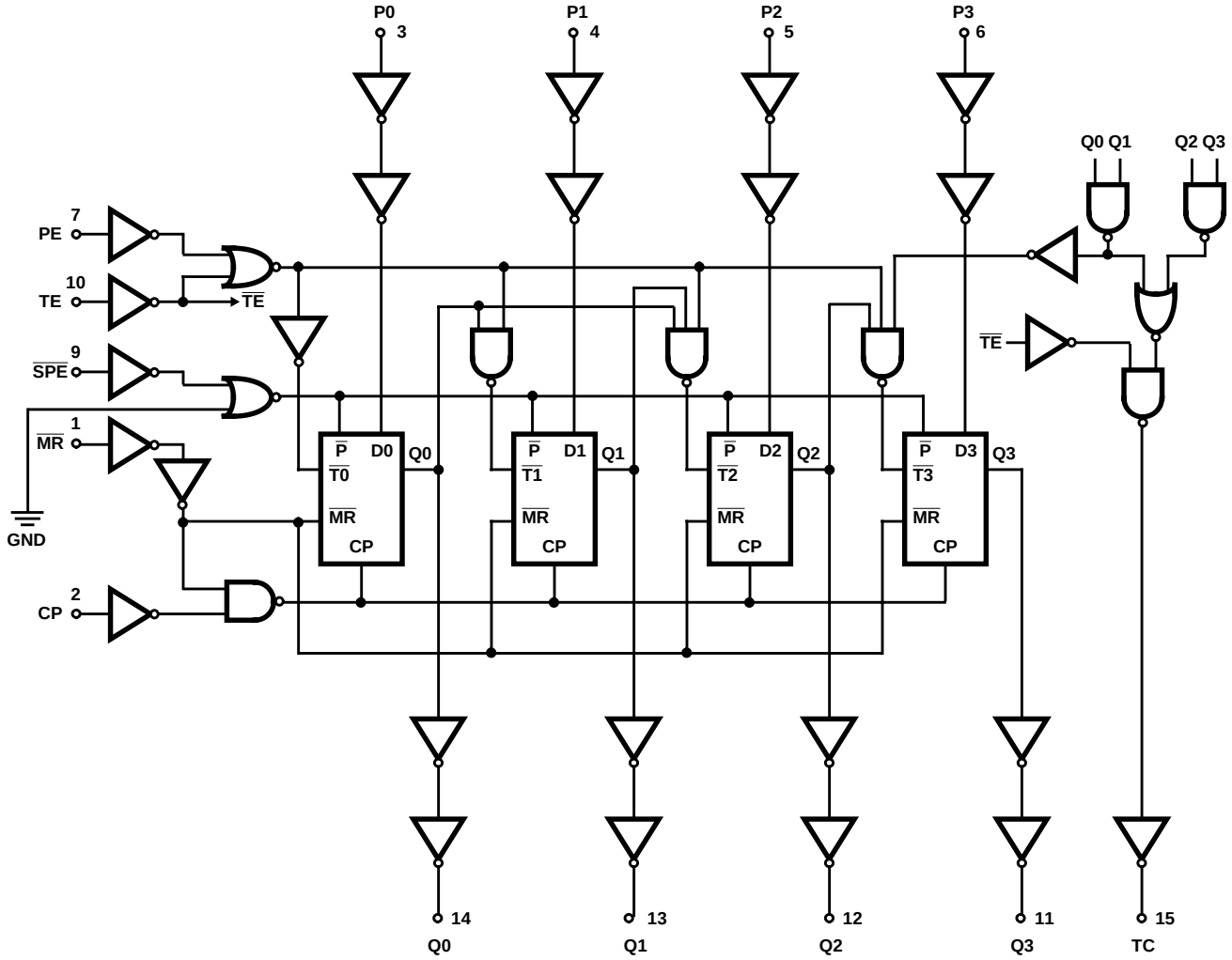
Ordering Information

PART NUMBER	TEMPERATURE RANGE	SCREENING LEVEL	PACKAGE
5962F9671601VEC	-55°C to +125°C	MIL-PRF-38535 Class V	16 Lead SBDIP
5962F9671601VXC	-55°C to +125°C	MIL-PRF-38535 Class V	16 Lead Ceramic Flatpack
ACTS161D/Sample	25°C	Sample	16 Lead SBDIP
ACTS161K/Sample	25°C	Sample	16 Lead Ceramic Flatpack
ACTS161HMSR	25°C	Die	Die

CAUTION: These devices are sensitive to electrostatic discharge; follow proper IC Handling Procedures.

Spec Number **518893**
File Number **4095**

Functional Diagram



TRUTH TABLE

OPERATING MODE	INPUTS						OUTPUTS	
	$\overline{MR}$	CP	PE	TE	$\overline{SPE}$	P_N	Q_N	TC
Reset (Clear)	L	X	X	X	X	X	L	L
Parallel Load	H	⎍	X	X	I	I	L	L
	H	⎍	X	X	I	h	H	(Note 1)
Count	H	⎍	h	h	h (Note 3)	X	count	(Note 1)
Inhibit	H	X	I (Note 2)	X	h (Note 3)	X	q_N	(Note 1)
	H	X	X	I (Note 2)	h (Note 3)	X	q_N	L

H = High Steady State, L = Low Steady State, h = High voltage level one setup time prior to the Low-to-High clock transition, I = Low voltage level one setup time prior to the Low-to-High clock transition, X = Don't Care,q = Lower case letters indicate the state of the referenced output prior to the Low-to-High clock transition, ⎍ = Low-to-High Transition.

NOTES:

1. The TC output is High when TE is High and the counter is at Terminal Count (HHHH).
2. The High-to-Low transition of PE or TE should only occur while CP is High for conventional operation.
3. The Low-to-High transition of $\overline{SPE}$ should only occur while CP is High for conventional operation.

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:

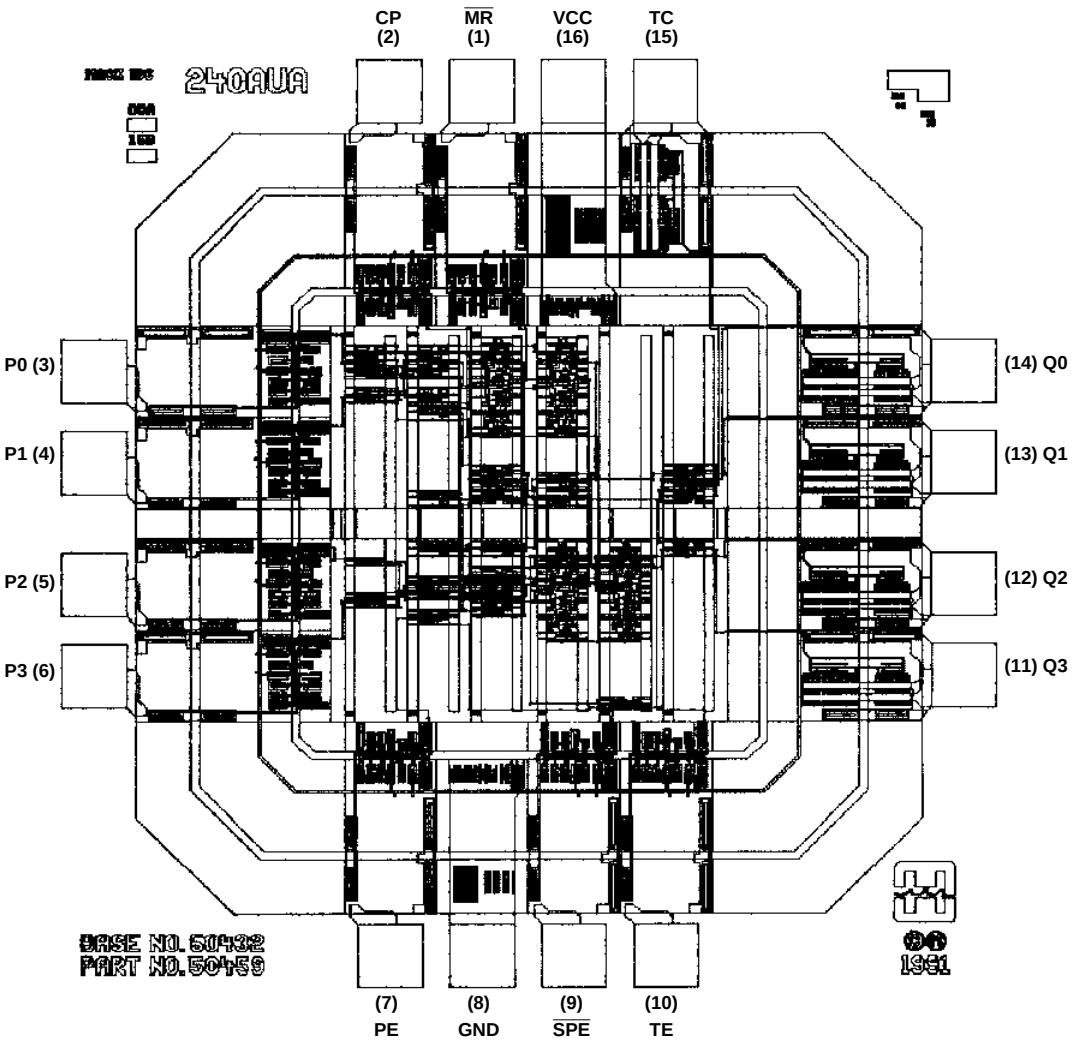
$< 2.0 \times 10^5 A/cm^2$

BOND PAD SIZE:

110µm x 110µm
4.3 mils x 4.3 mils

Metallization Mask Layout

ACTS161MS



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