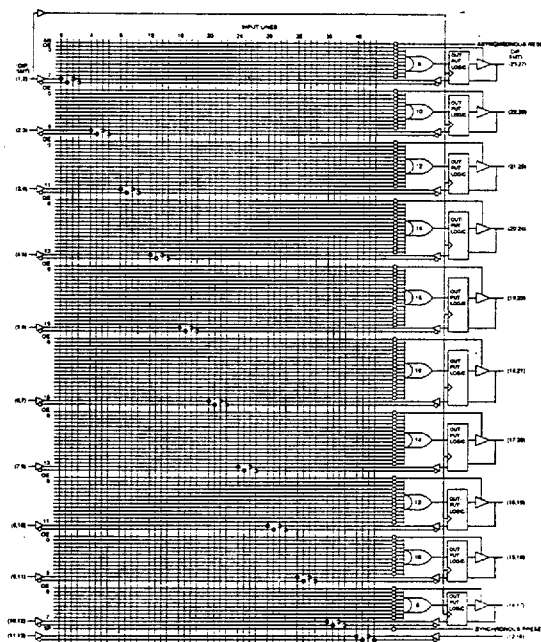


Programmable Logic - Radiation Hardened 22V10CRP

Class S Screening
High Speed PLD

*For Space
Applications*

SEI's 22V10RP (RP for RAD-PAK®) high speed PLD microcircuit features a minimum 100 kilorad (Si) total dose tolerance. Fully equivalent to the commercial 22V10, the 22V10CRP combines Atmel AT22V10L CMOS high performance technology and SEI's radiation hardened RAD-PAK® packaging. It is a One Time Programmable Device. With low DC power (8 mA typical) and full CMOS output levels, the 22V10CRP provides the optimum low power CMOS operation. It also significantly reduces total system power and enhances system reliability. The full CMOS output levels help reduce power in many other system components. Each output from the 22V10CRP is allocated from eight to 16 product terms, which allows highly complex logic function to be possible. Synchronous preset and asynchronous reset are included in two additional product terms. These terms apply to all 10 registers. Each individual registers are automatically cleared upon power up. A Security Fuse is available to prevent unauthorized copying of programmed fuse patterns. Register Preload is also available to provide easier testing.



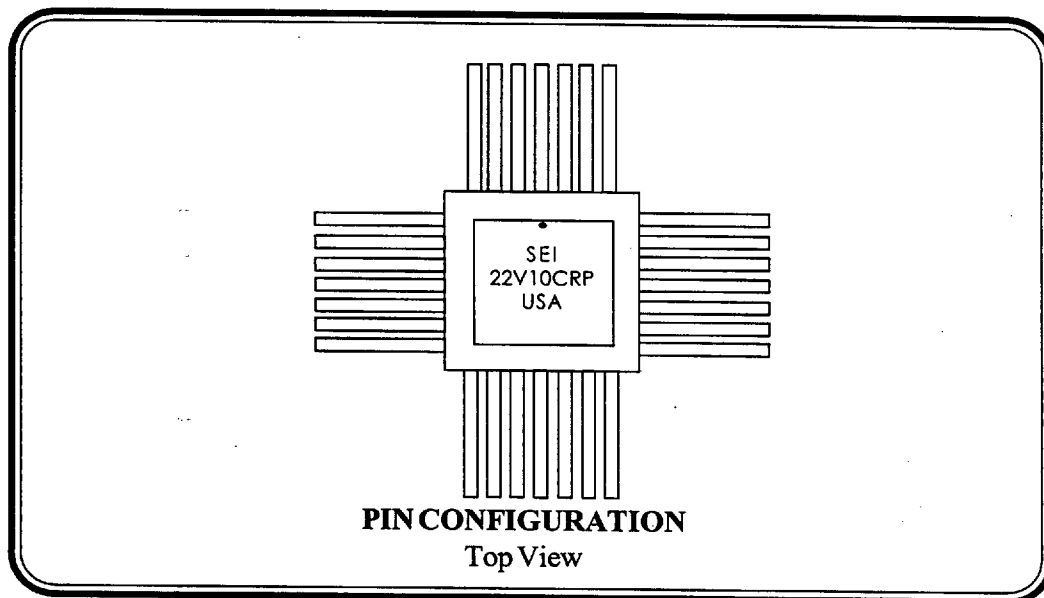
SPACE
ELECTRONICS
INCORPORATED

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SEI 22V10CRP RAD HARD PROGRAMMABLE LOGIC

Radiation Hardened 22V10CRP

Programmable Logic Device



Features:

- Second Generation PLD Architecture
 - One Time Programmable
- Pin Compatible with Atmel AT22V10/L
- RAD-PAK® Radiation Hardened Against Natural Space Radiation
- SEL: None
- SEU: None
- Total Dose Hardness >100 krad (Si)
- Package:
 - 28 Pin RAD-PAK® quad flat pack (1.15 in. x 1.15 in.)
 - Weight - 6.0 grams
 - 24 Pin RAD-PAK® flat pack (0.60 in. x 0.40 in.)
 - Weight - 4.8 grams
 - 24 Pin RAD-PAK® DIP (1.25 in. x 0.40 in.)
 - Weight - 5.0 grams
- Fast Propagation Time:
 - 15, 20, 25, 30 ns
- All registers are automatically cleared when power up
- High Speed CMOS Technology
 - CMOS and TTL compatible inputs and outputs
 - 2000 V ESD protection
 - 200 mA latchup immunity
- Screening per TM 5004
- QCI per TM5005
- 10 uA leakage maximum

Specifications and design are subject to change without notice.



February 1995

For Further Information Contact:

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22V10CRP ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNITS
Positive Supply Voltage	V_{CC}	-0.5	7.0	V
DC Voltage to Outputs (Except during programming)		-0.5	+VCC max	V
DC Voltage to Outputs (During programming)			16	V
Output Current into Outputs (During programming, 1 sec.)			200	mA
DC Input Voltage	V_{IN}	-0.5	5.5	V
DC Input Current	I_{IN}	-30	+5	mA
Power Dissipation	P_d		1200	mW
Storage Temperature Range	T_s	-65	+150	°C
Operating Temperature Range	T_A	-55	+125	°C

22V10CRP RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	MAX	UNITS
Positive Supply Voltage	V_{DD}	4.75	5.25	V
High Level Input Voltage	V_{IH}	2.0		V
Low Level Input Voltage	V_{IL}		0.8	V



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■ 9011241 0000424 596 ■

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22V10CRP DC CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Input Load Current $V_{IN} = -0.1V$ to $V_{CC} + 1V$	I_{IL}		10	μA
Output Leakage Current $V_{OUT} = -0.1V$ to $V_{CC} + 0.1V$	I_{LO}		10	μA
Power Supply Current $V_{CC} = MAX$, $V_{IN} = GND$, Outputs Open 22V10CRP-15,20 22V10CRP-25,30	I_{CC}		90 55	mA
Clocked Power Supply Current $f = 1MHz$, $V_{CC} = MAX$, Outputs Open	I_{CC2}		15	mA
Output Short Circuit Current $V_{OUT} = 0.5V$	I_{OS}		-90	mA
Input Low Voltage	V_{IL}	-0.6	0.8	V
Input High Voltage	V_{IH}	2.0	$V_{CC} + 0.75$	V
Output Low Voltage $V_{IN} = V_{IH}$ or V_{IL} , $V_{CC} = MIN$ $I_{OL} = 16 mA$	V_{OL}		0.5	V
Output High Voltage $V_{IN} = V_{IH}$ or V_{IL} , $V_{CC} = MIN$ $I_{OH} = -100 \mu A$ $I_{OH} = -4.0 mA$	V_{OH}	$V_{CC} - 0.3$ 2.4		V



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22V10CRP AC CHARACTERISTICS

PARAMETER	SYMBOL	MIN	MAX	UNITS
Input or Feedback to Non-Registered Output 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{PD}		15 20 25 30	ns
Input to Output Enable 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{EA}		15 20 25 30	ns
Input to Output Disable 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{ER}		15 20 25 30	ns
Clock to Feedback 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{CF}	0 0 0 0	2.5 8 10 15	ns
Clock to Output 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{CO}	0 0 0 0	10 12 15 20	ns
Input or Feedback Setup Time 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_s	10 12 15 20		ns
Hold Time 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_H	0 0 0 0		ns
Clock Period 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_p	12 20 24 30		ns
Clock Width 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_w	6 10 12 15		ns



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22V10CRP AC CHARACTERISTICS (Continued)

PARAMETER	SYMBOL	MIN	MAX	UNIT
External Feedback $1/(t_s+t_{co})$ 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	F_{MAX}		50.0 41.6 33.3 25.0	MHz
Internal Feedback $1/(t_s+t_{co})$ 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30			80.0 50.0 40.0 28.5	
No Feedback $1/(t_p)$ 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30			83.3 50.0 41.6 33.3	
Asynchronous Reset Width 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30		15 20 25 30		ns
Asynchronous Reset, Synchronous Preset, Recovery Time 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{AR}	15 20 25 30		ns
Asynchronous Reset to Registered Output Reset 22V10CRP-15 22V10CRP-20 22V10CRP-25 22V10CRP-30	t_{AP}		20 22 25 30	ns

22V10CRP Package Ordering Guide

Package Style	Case Outline 1/	Description
D	D-24	24 Pin Dual In Line Package
F	F-24	24 Pin Flat Package
Q	Q-28	28 Pin Quad Flat Package

Note:

1/ For outline information, see Appendix A (Package Information - Outline Dimension)



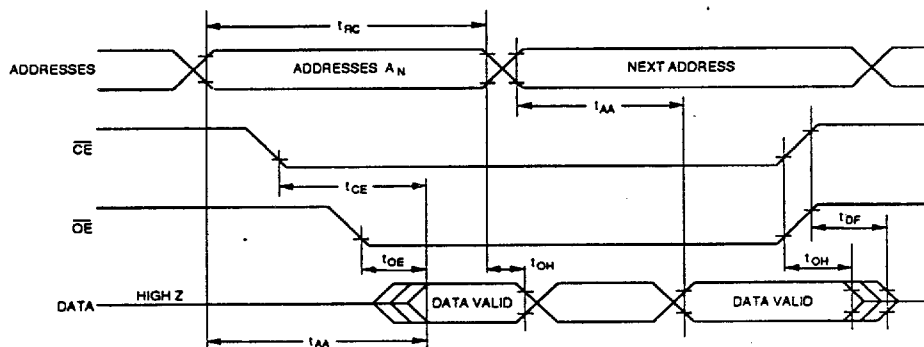
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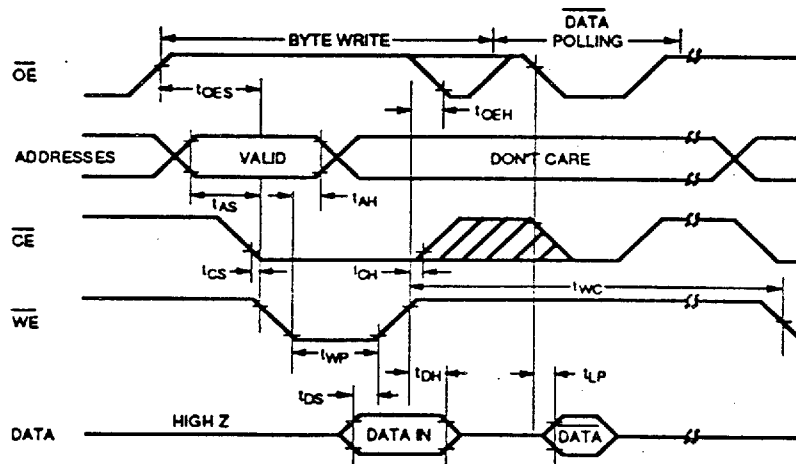
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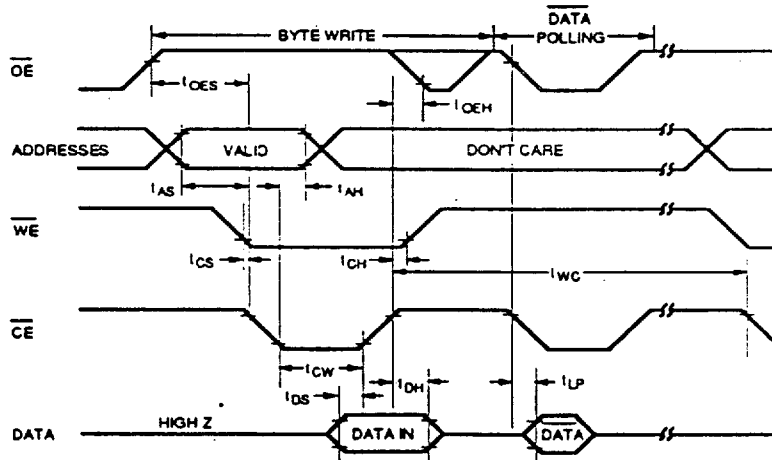
Read/Data Polling Cycle Time



$\overline{WE}$ CONTROLLED WRITE CYCLE



$\overline{CE}$ CONTROLLED WRITE CYCLE



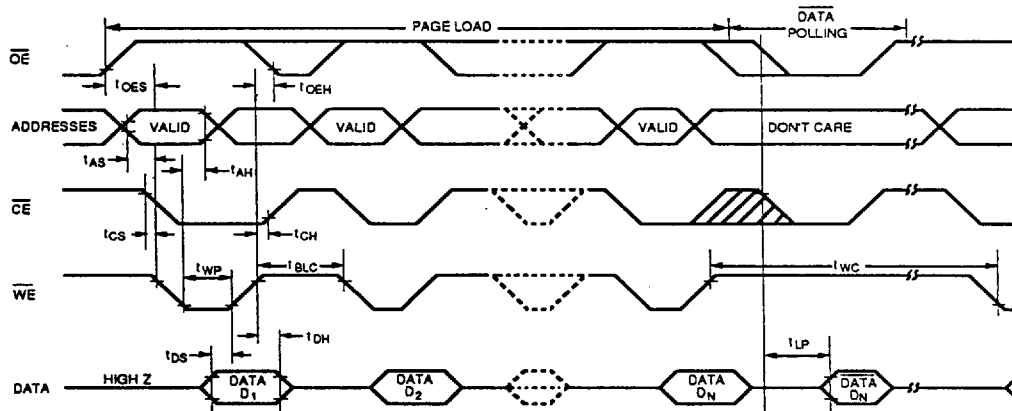
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Page Write Timing



22V10CRP PINOUT

PIN	SIGNAL	PIN	SIGNAL
1	CLK/IN	13	IN
2	IN	14	I/O
3	IN	15	I/O
4	IN	16	I/O
5	IN	17	I/O
6	IN	18	I/O
7	IN	19	I/O
8	IN	20	I/O
9	IN	21	I/O
10	IN	22	I/O
11	IN	23	I/O
12	GND	24	Vcc



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