4055916 GOULD SEMICONDUCTOR DIV 03E 10392 D

GOULD
Electronics

CMOS Programmable Electrically Erasable Logic Device

Preliminary Data Sheet

T-46-13-47

PEEL™22CV10Z

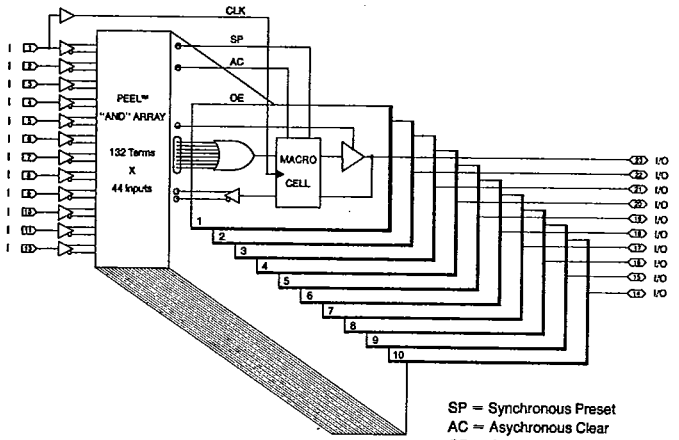
Features

- **Advanced CMOS EEPROM Technology**
- **Low Power Consumption**
  - —Zero Power Mode—100µA max standby
  - —35mA + 0.5mA/MHz max
- **High Performance**
  - —t_{PD} = 25ns max, t_{CO} = 15ns max
- **EE Reprogrammability**
  - —Superior programming and functional yield
  - —Low cost windowless package
  - —Erases and programs in seconds
- **Development/Programmer Support**
  - —Third-party software and programmers
  - —Gould PEEL Development System with APEEL™ Logic Assembler
- **Architectural Flexibility**
  - —132 product term X 44 input AND array
  - —Up to 22 inputs and 10 outputs
  - —Variable product term distribution (8 to 16 per output) for greater logic flexibility
  - —Independently programmable 12-configuration I/O macrocells
  - —Synchronous preset, asynchronous clear
  - —Independent programmable output enables
- **Application Versatility**
  - —Replaces random SSI/MSI logic
  - —Emulates 24-pin bipolar PAL devices
  - —Superset compatible with the bipolar AmPAL22V10 and CMOS PALC22V10

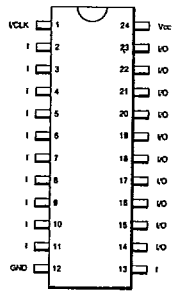
General Description

The Gould PEEL22CV10Z is a CMOS Programmable Electrically Erasable Logic Device that provides a high-performance, low-power, reprogrammable, and architecturally enhanced alternative to conventional programmable logic devices (PLDs). Designed in advanced CMOS EEPROM technology, the PEEL22CV10Z rivals speed parameters of comparable

Block Diagram



Pin Configuration



Pin Names

I/CLK = Input Only/Clock
I = Input Only
I/O = Bi-Directional Input/Output
GND = Ground
Vcc = Power Supply (+5V)

PLDs

T-46-13-47

GOULD
Electronics

PEEL™ 22CV10Z

Absolute Maximum Ratings Exposure to absolute maximum ratings over extended periods of time may affect device reliability. Exceeding absolute maximum ratings may cause permanent damage.

Symbol	Parameter	Conditions	Rating	Unit
V_{CC}	Supply Voltage	Relative to GND	−0.5 to +7.0	V
V_I, V_O	Voltage Applied to Any Pin[10]	Relative to GND[1,2]	−0.5 to V_{CC} + 0.6	V
I_O	Output Current	Per Pin (I_{OL}, I_{OH})	±25	mA
T_A	Ambient Temperature, Power Applied		−10 to +85	°C
T_{ST}	Storage Temperature		−65 to +150	°C
T_{LT}	Lead Temperature	Soldering 10 Seconds	+300	°C

Operating Ranges

Symbol	Alternate Source Symbol*	Parameter	Conditions	Min	Max	Unit
V_{CC}	V_{CC}	Supply Voltage	Commercial	4.75	5.25	V
T_A	T_A	Ambient Temperature	Commercial	0	70	°C
T_R		Clock Rise Time	See Note 5		250	ns
T_F		Clock Fall Time	See Note 5		250	ns
T_{RVCC}		V_{CC} Rise Time	See Note 5		10	ms

D.C. Electrical Characteristics Over the operating range.

Symbol	Alternate Source Symbol*	Parameter	Conditions	Min	Max	Unit
V_{OH}	V_{OH}	Output HIGH Voltage—TTL	V_{CC} = Min, I_{OH} = −4.0mA	2.4		V
V_{OHC}		Output HIGH Voltage—CMOS	V_{CC} = Min, I_{OH} = −10µA	V_{CC} − 0.1		V
V_{OL}	V_{OL}	Output LOW Voltage—TTL	V_{CC} = Min, I_{OL} = 8mA		0.5	V
V_{OLC}		Output LOW Voltage—CMOS	V_{CC} = Min, I_{OL} = 10µA		0.1	
	V_{IH}				V_{CC} + 0.3	V
	V_{IL}				0.8	V
I_{IX}	I_{IL}, I_{IH}, I_{IX}	Input Leakage Current	V_{CC} = Max, GND ≤ V_{IN} ≤ V_{CC}		±10	
I_{OZ}	I_{OZ}	Output Leakage Current	I/O = High-Z, GND ≤ V_O ≤ V_{CC}		±10	
I_{SC}	I_{SC}	Output Short Circuit Current	V_{CC} = Max, V_O = 0.5V	−30	−90	
	I_{CC}		V_{IN} = V_{CC} or GND[9]		45	mA
I_{CCAC}	I_{CC}	V_{CC} Current, Active, CMOS	V_{IN} = V_{CC} or GND.[9] All outputs open.		I_{CCSC} + 0.5mA/MHz	mA
I_{CCST}	I_{CC}	V_{CC} Current, Standby, TTL	V_{IN} = V_{IL} or V_{IH}[9]		55	
I_{CCAT}	I_{CC}	V_{CC} Current, Active, TTL	V_{IN} = V_{IL} or V_{IH}.[9] All outputs open.			mA
C_{IN}[14]	C_{IN}	Input Capacitance	T_A = 25°C, V_{CC} = 5.0V @ f = 1MHz		6	pF
C_{OUT}[14]	C_{OUT}	Output Capacitance			12	pF

*Alternate source symbols are shown for the convenience of those who wish to compare the specifications of the PEEL22CV10Z against the specifications of other, similar devices.

GOULD
Electronics

T-46-13-47

PEEL™22CV10Z

A.C. Electrical Characteristics Over the operating range[3].

Symbol	Alternate Source Symbol*	Parameter	22CV10Z-25		22CV10Z-30		22CV10Z-35		Unit
			Min	Max	Min	Max	Min	Max	
t_{PD}	t_{PD}	Input[4] or feedback to non-registered output		25		30		35	ns
t_{OE}	t_{EA}	Input[4] to output enable[6]		25		25		30	ns
t_{OD}	t_{ER}	Input[4] to output disable[6]		25		25		30	ns
t_{CO1}	t_{CO}	Clock to output		15		18		20	ns
t_{CO2}		Clock to combinatorial output delay via internal registered feedback		35		35		40	ns
t_{SC}	t_S	Input[4] or feedback setup to clock	20		25		30		ns
t_{HC}	t_H	Input[4] hold after clock	0		0		0		ns
t_{CL}, t_{CH}	t_W	Clock width—clock low time, clock high time[5]	12		15		15		ns
t_{CP1}		Clock period (register feedback to register output via internal path)	25		30		35		ns
f_{MAX1}		Maximum clock frequency ($1/t_{CP1}$)	40		43		28.5		MHz
t_{CP2}	t_P	Clock period ($t_{SC} + t_{CO1}$)	35		?		50		ns
f_{MAX2}	f_{MAX}	Maximum clock frequency ($1/t_{CP2}$)	28.5		23.2		20		MHz
t_{AW}	t_{AW}	Asynchronous clear pulse width	25		25		25		ns
t_{AP}	t_{AP}	Input[4] to asynchronous clear		25		30		35	ns
t_{AR}	t_{AR}	Asynchronous clear recovery time		25		30		35	ns
t_{RESET}		Power-on reset time for registers in clear state		5		5		5	µs

*Alternate source symbols are shown for the convenience of those who wish to compare the specifications of the PEEL22CV10Z against the specifications of other, similar devices.

bipolar PLDs while providing a dramatic improvement in active power consumption, along with a "zero-power" standby mode. The EE reprogrammability of the PEEL22CV10 reduces development and field retrofit costs and enhances testability to ensure 100% field programmability and function. PEEL technology allows for low cost "windowless" packaging in a 24-pin, 300-mil DIP.

The PEEL22CV10Z's flexible architecture offers complete function and JEDEC-file compatibility with the bipolar AmPAL22V10 and the CMOS PALC22V10 plus eight additional macrocell configurations (a total of twelve) that further expand its I/O and feedback design capabilities. Applications for the PEEL22CV10Z include: replacement of random SSI/MSI logic circuitry; emulation of 24-pin bipolar PAL devices; and user customized sequential and combinatorial functions such as counters, shift registers, state machines, address decoders, multiplexers, etc. Development and programming support for the PEEL22CV10Z is provided by Gould and third-party manufacturers.

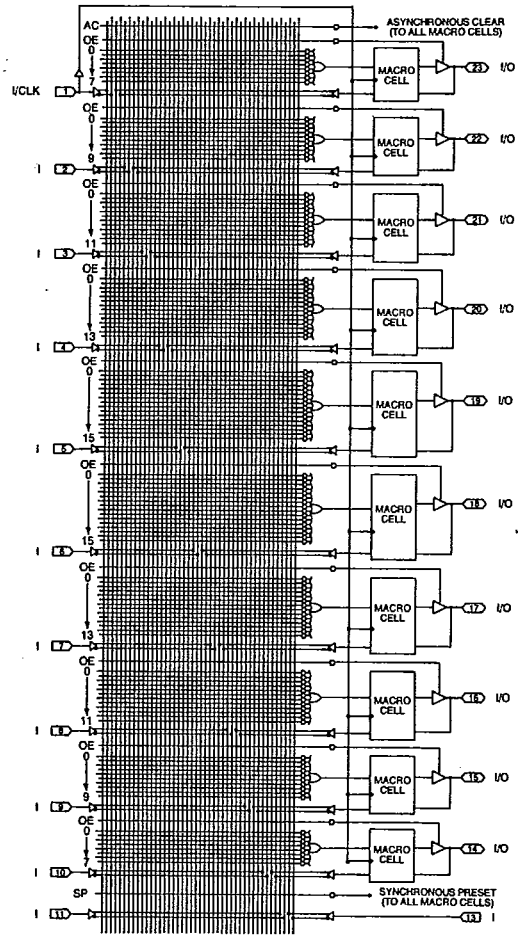
PLDs

GOULD
Electronics

T-46-13-47

PEEL™22CV10Z

PEEL22CV10 Logic Array Diagram

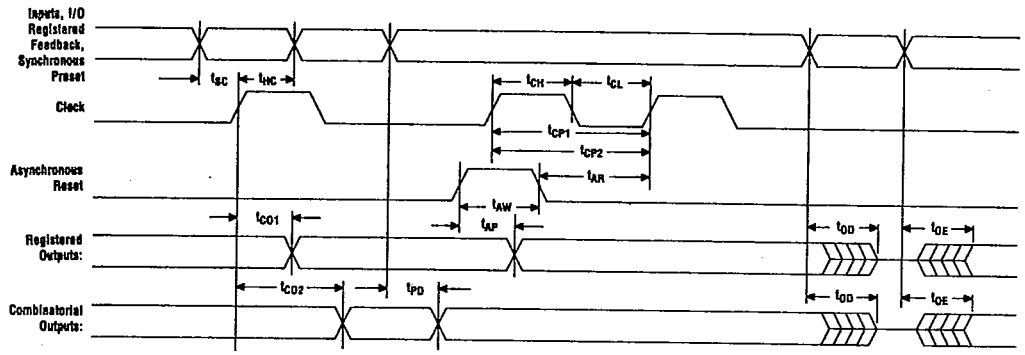


GOULD
Electronics

T-46-13-47

PEEL™22CV10Z

Switching Waveforms



Preliminary Designation

The "Preliminary" designation on a Gould data sheet indicates that the product is not characterized. The specifications are subject to change, are based on design goals or preliminary part evaluation, and are not guaranteed. Gould or an authorized sales representative should be consulted for current information before using this product.

PLDs