, INC.

PEEL™273-12/PEEL™273-15
CMOS Programmable Electrically Erasable Logic Device

Features

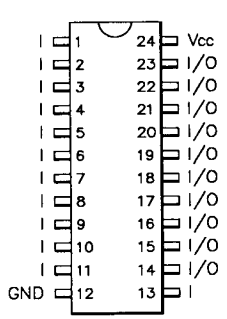
- **ADVANCED CMOS EEPROM TECHNOLOGY**
- **LOW POWER CONSUMPTION**
  - 60mA + 0.5mA/MHz max
- **HIGH PERFORMANCE**
  - t_{PD} = 12ns max, t_{OE} = 12ns max
- **ARCHITECTURAL FLEXIBILITY**
  - 12 inputs and 10 I/Os
  - Programmable AND/OR arrays with 42 product terms/0 sum terms
- **EE REPROGRAMMABILITY**
  - Superior programming and functional yield
  - Low cost windowless package
  - Erases and programs in seconds
- **FPLA ARCHITECTURE**
- **SUPERSET REPLACEMENT FOR PLS173**
  - Ten additional product terms
  - Output-enable terms in OR array
  - Signature word
  - Foolproof design security
- **APPLICATION VERSATILITY**
  - Replace random SSI/MSI logic
  - Create customized comparators, multiplexers,encoders, converters, etc.
- **DEVELOPMENT SUPPORT**
  - Third-party software and programmers
  - ICT PEEL Development System and software.

General Description

The ICT PEEL273-12 and PEEL273-15 are CMOS Programmable Electrically Erasable Logic devices that provide a high-performance, low-power, reprogrammable, and architecturally enhanced alternative to conventional programmable logic devices (PLDs). Designed in advanced CMOS EEPROM technology, the PEEL273 rivals speed parameters of comparable bipolar PLDs while providing a dramatic improvement in active power consumption. The EE-reprogammability of the PEEL273 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 ceramic or plastic 24-pin, 300-mil DIP.

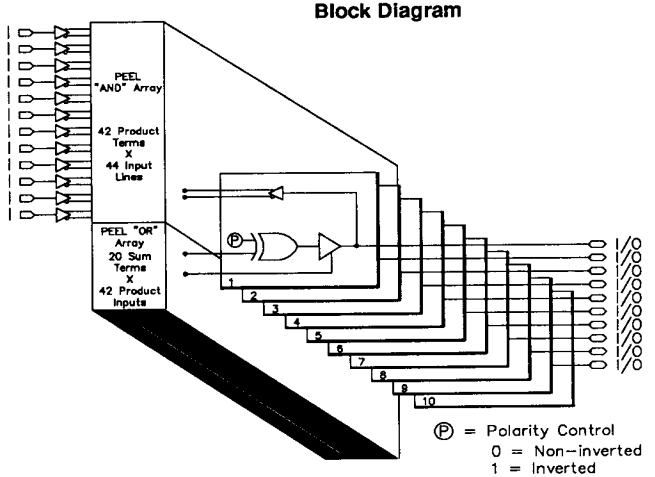
The PEEL273 provides both a programmable AND array and a programmable OR array. It offers superset compatibility with the bipolar PLS173 with several architectural enhancements, including: output enable terms in the OR array, 10 additional product terms, and signature word. Applications for the PEEL273 cover a wide range of combinatorial functions, such as: replacement of random SSI/MSI logic circuitry, priority encoders, comparators, parity generators, code converters, address decoders, and multiplexers. Development and software support for the PEEL273 is provided by ICT and third-party manufacturers.

Pin Configuration



Pin Names
I = Dedicated Input
I/O = Bidirectional I/O
GND = Ground
Vcc = Power Supply (5V)

Block Diagram



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	– 0.6 to +7.0	V
V_{IO}	Voltage Applied to Any Pin [6]	Relative to GND [1]	– 0.6 to V_{CC} + 0.6	V
T_A	Ambient Temp, 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	Parameter	Conditions	Min	Max	Unit
V_{CC}	Supply Voltage	Commercial	4.75	5.25	V
T_A	Ambient Temperature	Commercial	0	70	°C

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D.C. Electrical Characteristics

Over the operating range

Symbol	Parameter	Conditions	Min	Max	Unit
V_{IH}	Input HIGH Level		2.0	V_{CC} + 0.3	V
V_{IL}	Input LOW Level		– 0.3	0.8	V
V_{OH}	Output HIGH Voltage	V_{CC} = Min, I_{OH} = – 4mA	2.4		V
V_{OHC}	Output HIGH Voltage CMOS	V_{CC} = Min, I_{OH} = – 10µA	V_{CC} – 0.1		V
V_{OL}	Output LOW Voltage	V_{CC} = Min, I_{OL} = 16mA		0.5	V
V_{OLC}	Output LOW Voltage CMOS	V_{CC} = Min, I_{OL} = 10µA		0.1	V
I_L	Input Leakage Current	V_{CC} = Max, GND ≤ V_I ≤ V_{CC}		10	µA
I_{OS}	Output Short Circuit Current [2]	V_{CC} = 5V, V_O=GND, T_A = 25°C	-30	– 100	mA
I_{OZ}	Output Leakage Current	I/O = High Impedence V_{CC} = Max, GND ≤ V_O ≤ V_{CC}		± 10	µA
I_{CCAC}	Power Supply Current, Active, CMOS Interface	V_{IN} = Vcc or GND. All inputs, feedback, and I/Os switching [3]		50 + .5mA/MHz	mA
I_{CCAT}	Power Supply Current, Active, TTL Interface	V_{IN} = V_{IL} or V_{IH}. All inputs, feedback, and I/Os switching [3]		60 + .5mA/MHz	mA

Capacitance

These measurements are periodically sample tested..

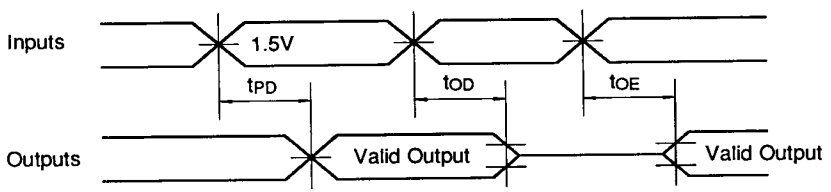
Symbol	Parameter	Conditions	Min	Max	Unit
C_{IN}	Input Capacitance	T_A = 25°C V_{CC} = 5.0V, f = 1kHz		6	pF
C_{OUT}	Output Capacitance			12	pF

A.C. Electrical Characteristics

Over the Operating Range [4,7]

Symbol	Parameter	PEEL273-12		PEEL273-15		Unit
		Min	Max	Min	Max	
t_{PD}	Propagation Delay, Input to Output		12		15	ns
t_{OE}	Input toOutput Enable [5]		12		15	ns
t_{OD}	Input to Output Disable [5]		12		15	ns

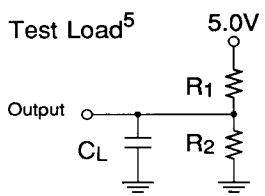
Switching Waveforms

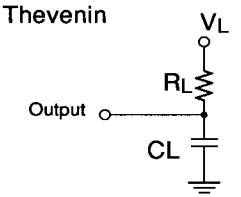


Notes:

1. Minimum DC input is – 0.5V, however, inputs may undershoot to – 2.0V for periods less than 30ns.
2. Test one ouput at a time. Duration of short circuit should not exceed 1 second.
3. All I/O pins open (no load).
4. Test conditions assume: signal transitions of 5ns or less fron the 10% and 90% points; timing reference levels of 1.5V (unless otherwise specified);and test loads shown.
5. t_{OE} is measured from input transition to $V_{REF} \pm 0.1V$. t_{OD} is measured from input transition to $V_{OH} - 0.1V$ or $V_{OL} + 0.1V$.
6. V_{IO} specified is not for program/verify operation. Contact ICT for information regarding PEEL273 program/verify specifications
7. PEEL Device test loads are specified at the end of this section.

PEEL Device Test Loads





Part Number	Test Loads				
	CMOS Interface		TTL Interface		
	R1	R2	R1	R2	C_L
PEEL18CV8P-25	480KΩ	480KΩ	464Ω	250Ω	50pF
PEEL18CV8P-10/15	480KΩ	480KΩ	319Ω	197Ω	50pF
PEEL20CG10P-25	480KΩ	480KΩ	448Ω	245Ω	50pF
PEEL20CG10AP-10/15	480KΩ	480KΩ	235Ω	159Ω	50pF
PEEL22CV10P-25	480KΩ	480KΩ	448Ω	245Ω	50pF
PEEL22CV10AP-10/15	480KΩ	480KΩ	235Ω	159Ω	50pF
PEEL22CV10ZP-25/35	480KΩ	480KΩ	448Ω	245Ω	50pF
PEEL173/PEEL273-10/12	480KΩ	480KΩ	235Ω	159Ω	50pF
PA7024-1/2	480KΩ	480KΩ	448Ω	245Ω	50pF
PA7128-1/2	480KΩ	480KΩ	308Ω	193Ω	50pF
PA7140-1/2	480KΩ	480KΩ	448Ω	245Ω	50pF

Part Number	Thevenin Equivalent				
	CMOS Interface		TTL Interface		
	R_L	V_L	R_L	V_L	C1
PEEL18CV8P-25	228KΩ	2.375V	163Ω	1.75V	50pF
PEEL18CV8P-10/15	228KΩ	2.375V	122Ω	1.91V	50pF
PEEL20CG10P-25	228KΩ	2.375V	158Ω	1.77V	50pF
PEEL20CG10AP-10/15	228KΩ	2.375V	95Ω	2.02V	50pF
PEEL22CV10P-25	228KΩ	2.375V	158Ω	1.77V	50pF
PEEL22CV10AP-10/15	228KΩ	2.375V	95Ω	2.02V	50pF
PEEL22CV10ZP-25/35	228KΩ	2.375V	158Ω	1.77V	50pF
PEEL173/PEEL273-10/12	228KΩ	2.375V	95Ω	2.02V	50pF
PA7024-1/2	228KΩ	2.375V	158Ω	1.77V	50pF
PA7128-1/2	228KΩ	2.375V	119Ω	1.925V	50pF
PA7140-1/2	228KΩ	2.375V	158Ω	1.77	50pF