FULLY DECODED 16,384 BIT MASK PROGRAMMABLE READ ONLY MEMORY

DESCRIPTION

The NEC μPD2316E is a high speed 16,384 bit mask programmable Read Only Memory organized as 2048 words by 8 bits. The μPD2316E is fabricated with N-channel MOS technology.

The inputs and outputs are fully TTL compatible. The device operates with a single +5V power supply. The three chip select inputs are programmable. Any combination of active high or low level chip select inputs can be defined and desired chip select code is fixed during the masking process.

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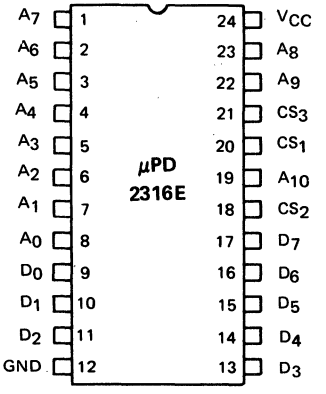
FEATURES

- High Speed – Access Times: μPD2316E – 450 ns
  μPD2316E-1 – 350 ns
- 2048 Words x 8 Bits Organization
- Single +5V ±10% Power Supply Voltage
- Directly TTL Compatible – All Inputs and Outputs
- Three Programmable Chip Select Inputs for Easy Memory Expansion
- Three-State Output – OR-Tie Capability
- On-Chip Address Fully Decoded
- All Inputs Protected Against Static Charge
- Direct Replacement for 2316E
- Available in 24-pin plastic or ceramic dual-in-line packages

PIN CONFIGURATION

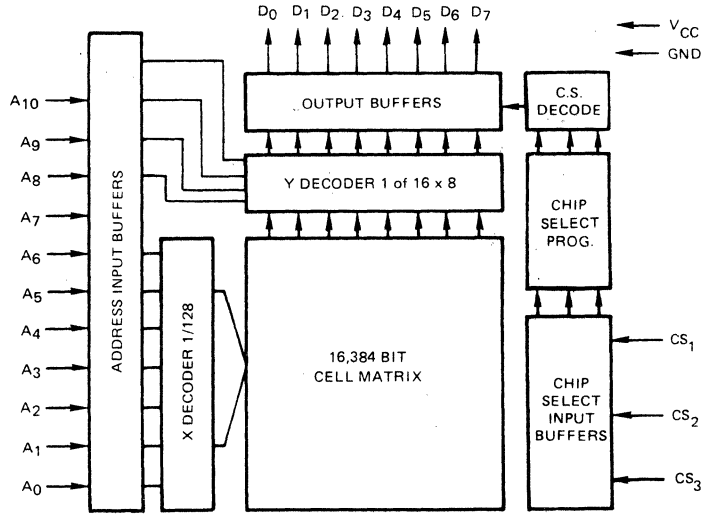


PIN NAMES

$A_0 - A_{10}$	Address Inputs
$D_0 - D_7$	Data Outputs
$CS_1 - CS_3$	Programmable Chip Select Inputs

Rev/1

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS*

Operating Temperature . . . . . −10°C to +70°C
Storage Temperature . . . . . −65°C to +125°C
Voltage on Any Pin . . . . . −0.5 to +7.0 Volts (1)

Note: (1) With Respect to Ground.

COMMENT: Stress above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

*T_a = 25°C

DC CHARACTERISTICS

T_a = −10°C to +70°C; V_{CC} = +5V ± 10% unless otherwise noted.

PARAMETER	SYMBOL	LIMITS MIN	LIMITS TYP (1)	LIMITS MAX	UNIT	TEST CONDITIONS
Input Load Current (All Input Pins)	I_{LI}			+10	μA	$V_{IN} = V_{CC}$
				−10	μA	V_{IN} = 0V
Output Leakage Current	I_{LOH}			+10	μA	Chip Deselected, $V_O = V_{CC}$
Power Supply Current	I_{CC}		60	85	mA	
Input "Low" Voltage	V_{IL}	−0.5		0.8	V	
Input "High" Voltage	V_{IH}	2.0		V_{CC}	V	
Output "Low" Voltage	V_{OL}			0.4	V	I_{OL} = 3.2 mA
Output "High" Voltage	V_{OH}	+2.4			V	I_{OH} = −200 μA

Note: (1) Typical values for T_a = 25°C and nominal supply voltage.

CAPACITANCE

$T_a = 25°C$; f = 1 MHz

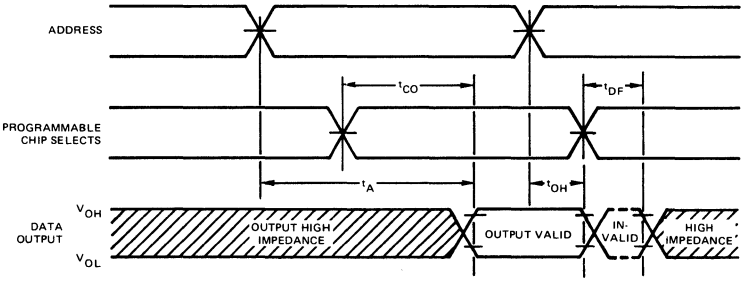
PARAMETER	SYMBOL	LIMITS MIN	LIMITS TYP	LIMITS MAX	UNIT	TEST CONDITIONS
Input Capacitance	C_{IN}		5	7	pf	All Pins Except Pin Under Test Tied to AC Ground
Output Capacitance	C_{OUT}		7	10	pf	All Pins Except Pin Under Test Tied to AC Ground

AC CHARACTERISTICS

$T_a = -10°C$ to $+70°C$, $V_{CC} = +5V \pm 10\%$; unless otherwise specified.

PARAMETER	SYMBOL	LIMITS μPD2316E MIN.	LIMITS μPD2316E MAX.	LIMITS μPD2316E-1 MIN.	LIMITS μPD2316E-1 MAX.	UNIT	TEST CONDITIONS
Address to Output Delay Time	t_{ACC}		450		350	ns	$t_T = t_r = t_f = 20$ ns
Chip Select to Output Enable Delay Time	t_{CO}		150		150	ns	$C_L = 100$ pF
Chip Deselect to Output Data Float Delay Time	t_{DF}	0	150		100	ns	Load = ITTL gate
Output Hold Time	t_{OH}	20		20		ns	$V_{IN} = 0.8$ to 2V V_{ref} Input = 1.5V V_{ref} Output = 0.45/2.2V

TIMING WAVEFORMS



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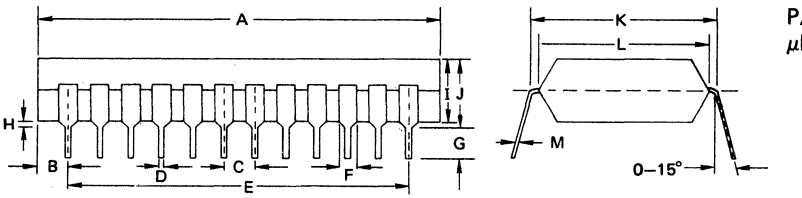
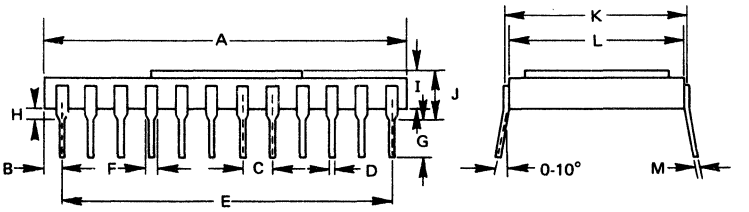


PACKAGE OUTLINE
μPD2316EC

(Plastic)

ITEM	MILLIMETERS	INCHES
A	33 MAX	1.3 MAX
B	2.53	0.1
C	2.54	0.1
D	0.5 ± 0.1	0.02 ± 0.004
E	27.94	1.1
F	1.5	0.059
G	2.54 MIN	0.1 MIN
H	0.5 MIN	0.02 MIN
I	5.22 MAX	0.205 MAX
J	5.72 MAX	0.225 MAX
K	15.24	0.6
L	13.2	0.55 MAX.
M	$0.25^{+0.10}_{-0.05}$	$0.01^{+0.004}_{-0.0019}$



μPD2316ED

(Ceramic)

ITEM	MILLIMETERS	INCHES
A	30.78 MAX.	1.23 MAX.
B	1.53 MAX.	0.07 MAX.
C	2.54 ± 0.1	0.10 ± 0.004
D	0.46 ± 0.8	0.018 ± 0.03
E	27.94 ± 0.1	1.10 ± 0.004
F	1.02 MIN.	0.04 MIN.
G	3.2 MIN.	0.125 MIN.
H	1.02 MIN.	0.04 MIN.
I	3.23 MAX.	0.13 MAX.
J	4.25 MAX.	0.17 MAX.
K	15.24 TYP.	0.60 TYP.
L	14.93 TYP.	0.59 TYP.
M	0.25 ± 0.05	0.010 ± 0.002