NEC
μPD2332A
μPD2332A-1
μPD2332B
μPD2332B-1

FULLY DECODED 32,768 BIT MASK PROGRAMMABLE READ ONLY MEMORY

DESCRIPTION

The NEC μPD2332A/B is a Fully Decoded 32,768 Bit Mask Programmable Read-Only Memory organized as 4,096 Words by 8 Bits. The μPD2332A/B has two chip select inputs and the combination of "High"/"Low" levels of these inputs is mask-programmable.

The μPD2332A/B is fabricated with sophisticated N-channel MOS technology and features high speed and TTL compatibility for simple interface with bipolar circuits.

FEATURES

- 4096 Words x 8 Bits Organization
- Directly TTL Compatible — All Inputs and Outputs
- Fully Static (No Clock or Refresh Required)
- Single +5V Power Supply
- High Speed — Access Times: μPD2332A/B — 450 ns
  μPD2332A/B-1 — 350 ns
- Three-State Output — OR-Tie Capability
- Two Programmable Chip Select Inputs for Easy Memory Expansion
- Available in Either JEDEC Pinout: μPD2332A or μPD2332B
- N-Channel MOS Technology
- Available in 24 Pin Plastic or Ceramic Dual-in-Line Package

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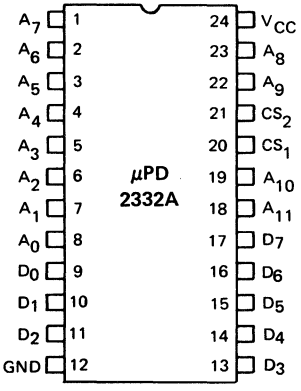
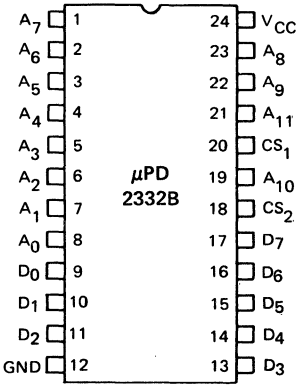
PIN CONFIGURATIONS





PIN NAMES

$A_0 - A_{11}$	Address Inputs
$D_0 - D_7$	Data Outputs
$CS_1 - CS_2$	Programmable Chip Select Inputs

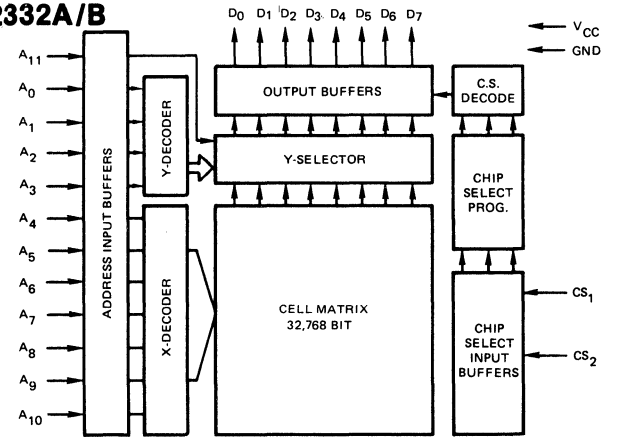
When ordering the μPD2332A/B, specify a chip select combination of CS_1 and CS_2 from the following.

CS_2	CS_1
0	0
0	1
1	0
1	1

Rev/2

μPD2332A/B

BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS*

Operating Temperature . . . . . −10°C to +70°C
Storage Temperature . . . . . −65°C to +125°C
Supply Voltage On Any Pin . . . . . −0.5 to +7.0 Volts①

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 specified.

PARAMETER	SYMBOL	LIMITS MIN.	LIMITS TYP.①	LIMITS MAX.	UNIT	TEST CONDITIONS
Input Load Current (All Input Pins)	I_{LI}			10	μA	V_{IN} = 0 to +5.5V
Output Leakage Current	I_{LOH}			+10	μA	CS = 2.2V (Deselected) V_{OUT} = V_{CC}
Output Leakage Current	I_{LOL}			−10	μA	CS = 2.2V (Deselected) V_{OUT} = OV
Power Supply Current	I_{CC}		60	90	mA	All inputs 5.25V Data Out Open
Input "Low" Voltage	V_{IL}	−0.5		0.8	V	
Input "High" Voltage	V_{IH}	2.0		V_{CC} + 1.0V	V	
Output "Low" Voltage	V_{OL}			0.40	V	3.2 mA
Output "High" Voltage	V_{OH}	2.4			V	−200 μA

Note: ① Typical Values for T_a = 25°C and nominal supply voltages.

CAPACITANCE

T_a = 25°C; f = 1 MHz

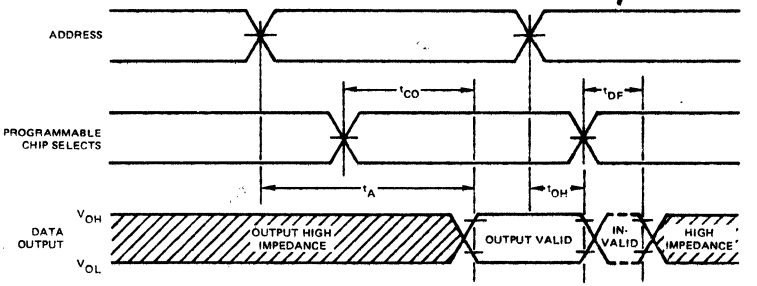
PARAMETER	SYMBOL	LIMITS MIN.	LIMITS TYP.	LIMITS MAX.	UNIT	TEST CONDITIONS
Input Capacitance	C_{IN}			10	pF	All Pins Except Pin Under Test Tied to AC Ground
Output Capacitance	C_{OUT}			15	pF	All Pins Except Pin Under Test Tied to AC Ground

AC CHARACTERISTICS

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

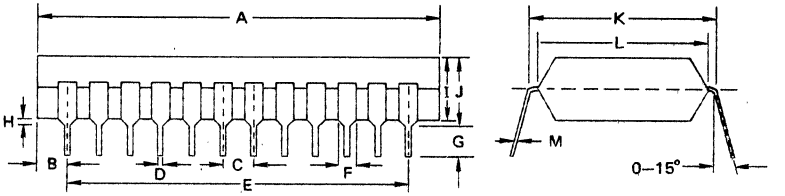
PARAMETER	SYMBOL	LIMITS μPD2332A/B MIN.	LIMITS μPD2332A/B MAX.	LIMITS μPD2332A/B-1 MIN.	LIMITS μPD2332A/B-1 MAX.	UNIT	TEST CONDITIONS
Address to Output Delay Time	t_{ACC}		450		350	ns	t_T = t_r = t_f = 20 ns
Chip Select to Output Enable Delay Time	t_{CO}		150		150	ns	C_L = 100 pF
Chip Deselect to Output Data Float Delay Time	t_{DF}	0	150		100	ns	Load = 1TTL 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



PACKAGE OUTLINE

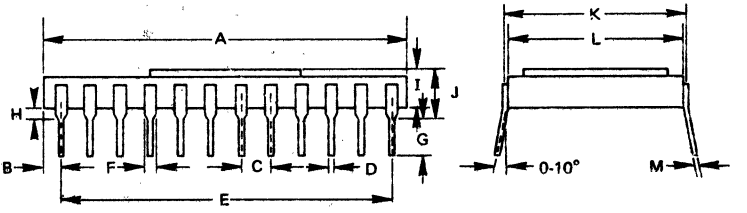
μPD2332C
μPD2332AC
μPD2332BC



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	$0.25^{+0.10}_{-0.05}$	$0.01^{+0.004}_{-0.0019}$

μPD2332D
μPD2332AD
μPD2332BD



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