

NEC
NEC Electronics Inc.

μ PD4264400, 4265400
16,777,216 x 4-Bit
Dynamic CMOS RAM

Preliminary

September 1993

Description

The μ PD4264400 and μ PD4265400 are 64M-bit dynamic RAMs organized as 16,777,216 words by 4 bits. They are designed to operate from a single +3.3-volt power supply and have an optional fast-page mode.

Advanced polycide technology minimizes silicon areas and provides high storage cell capacity, high performance, and high reliability. A single-transistor dynamic storage cell and advanced CMOS circuitry throughout ensure minimum power dissipation, while an on-chip circuit internally generates the negative voltage substrate bias—automatically and transparently.

The three-state outputs are controlled by $\overline{\text{CAS}}$ independent of $\overline{\text{RAS}}$. After a valid read or read-modify-write cycle, data is held on the outputs by maintaining $\overline{\text{CAS}}$ low. Data outputs return to high impedance when $\overline{\text{CAS}}$ goes high. Fast-page read and write cycles can be executed by cycling $\overline{\text{CAS}}$.

Refreshing may be accomplished by a $\overline{\text{CAS}}$ before $\overline{\text{RAS}}$ cycle that internally generates the refresh address. Refreshing can also be accomplished by $\overline{\text{RAS}}$ -only refresh cycles or by normal read or write cycles during a 64-ms refresh period.

Two versions of the 16M x 4-bit DRAM are available. The μ PD4264400 uses 8192 combinations of $A_0 - A_{12}$ for

$\overline{\text{RAS}}$ -only refreshing and 4096 address combinations of $A_0 - A_{11}$ to perform $\overline{\text{CAS}}$ before $\overline{\text{RAS}}$ and hidden refreshing of the memory during a 64-ms period. The μ PD4265400 uses 4096 address combinations of $A_0 - A_{11}$ during a 64-ms period for all refresh modes.

The μ PD4264400 and μ PD4265400 are available in a 34-pin plastic SOJ and 34-pin plastic TSOP.

Features

- 16,777,216 x 4-bit organization
- Single +3.3-volt power supply
- Fast-page option
- Low power dissipation: 1.80 mW (max) standby
- $\overline{\text{CAS}}$ before $\overline{\text{RAS}}$ refresh cycles
- Multiplexed address inputs
- On-chip substrate bias generator
- TTL-compatible inputs and outputs
- Nonlatched, three-state outputs
- Low input capacitance
- 34-pin plastic SOJ and TSOP packaging

Ordering Information

Part Number	Access Time (max)	R/W Cycle (max)	Fast-Page Cycle (max)	Active Power (max)	Package
μ PD4264400LG-A50	50 ns	90 ns	35 ns	360 mW	34-pin plastic SOJ
-A60	60 ns	110 ns	40 ns	324 mW	
-A70	70 ns	130 ns	45 ns	288 mW	
-A80	80 ns	150 ns	50 ns	252 mW	
μ PD4264400G7-A50	50 ns	90 ns	35 ns	360 mW	34-pin plastic TSOP
-A60	60 ns	110 ns	40 ns	324 mW	
-A70	70 ns	130 ns	45 ns	288 mW	
-A80	80 ns	150 ns	50 ns	252 mW	
μ PD4265400LG-A50	50 ns	90 ns	35 ns	468 mW	34-pin plastic SOJ
-A60	60 ns	110 ns	40 ns	396 mW	
-A70	70 ns	130 ns	45 ns	360 mW	
-A80	80 ns	150 ns	50 ns	324 mW	
μ PD4265400G7-A50	50 ns	90 ns	35 ns	468 mW	34-pin plastic TSOP
-A60	60 ns	110 ns	40 ns	396 mW	
-A70	70 ns	130 ns	45 ns	360 mW	
-A80	80 ns	150 ns	50 ns	324 mW	

μPD4264400, 4265400

34-Pin Plastic SOJ (500-mil)

Item	Millimeters	Inches
B	22.42 ± 0.2	.883 ± 0.008
C	12.7	.500
D	13.72 ± 0.2	.540 ± 0.008
E	1.05 ± 0.15	.041 + .007 -.005
F	0.74	.029
G	3.5 ± 0.2	.138 ± .008
H	2.545 ± 0.2	.100 ± .008
I	0.8 min	.031 min
J	2.6	.102
K	1.27 (TP)	.050 (TP)
M	0.40 ± 0.10	.016 + .004 -.005
N	0.12	.005
P*	11.94 ± 0.2	.470 ± .008
Q	0.10	.004
T	0.85 rad	.033 rad
U	0.20 + 0.10 -0.05	.008 + .004 -.002

* Item P to center of leads.

SOJ or TSOP

V _{CC}	1	34	V _{SS}
I/O ₁	2	33	I/O ₈
I/O ₂	3	32	I/O ₇
I/O ₃	4	31	I/O ₆
I/O ₄	5	30	I/O ₅
NC	6	29	V _{SS}
V _{CC}	7	28	CAS
WE	8	27	OE
RAS	9	26	NC
NC	10	25	A ₁₂
A ₀	11	24	A ₁₁
A ₁	12	23	A ₁₀
A ₂	13	22	A ₉
A ₃	14	21	A ₈
A ₄	15	20	A ₇
A ₅	16	19	A ₆
V _{CC}	17	18	V _{SS}

- A₀ to A₁₁(A₁₂) Address inputs
- I/O₁ to I/O₈ Data inputs/outputs
- RAS Row address strobe
- CAS Column address strobe
- WE Write enable
- OE Output enable
- V_{CC} Supply voltage
- V_{SS} Ground
- NC No connection

34-Pin Plastic TSOP (500 mil)

Item	Millimeters	Inches
A	22.66 max	.893 max
B	1.20 max	.048 max
C	1.27 (TP)	.050 (TP)
D	0.40 ± 0.10	.016 ± .004
E	0.05 ± 0.05	.002 ± .002
F	1.10 max	.044 max
G	0.97	.038
H	14.3 ± 0.2	.563 ± 0.008
I	12.7 ± 0.1	.500 ± 0.004
J	0.8 ± 0.2	.031 ± .008
K	0.125 + 0.10 -0.05	.005 + .004 -.002
L	0.5 ± 0.1	.020 + .004 -.005
M	0.21	.009
N	0.10	.004

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