

**Product Brief**

May 1994

**Description**

The μPD4216405 devices are dynamic CMOS RAMs with an optional hyper-page mode organized as 4,194,304 words by 4 bits. A single-transistor dynamic storage cell, a CMOS sense amplifier, and peripheral circuits ensure minimum power dissipation and high-speed access cycle times.

Refreshing is accomplished by performing  $\overline{\text{RAS}}$ -only refresh cycles, hidden refresh cycles,  $\overline{\text{CAS}}$  before  $\overline{\text{RAS}}$  refresh cycles, or normal read or write cycles on the 4,096 address combinations of  $A_0$  through  $A_{11}$  during a 64-ms refresh period.

**Features**

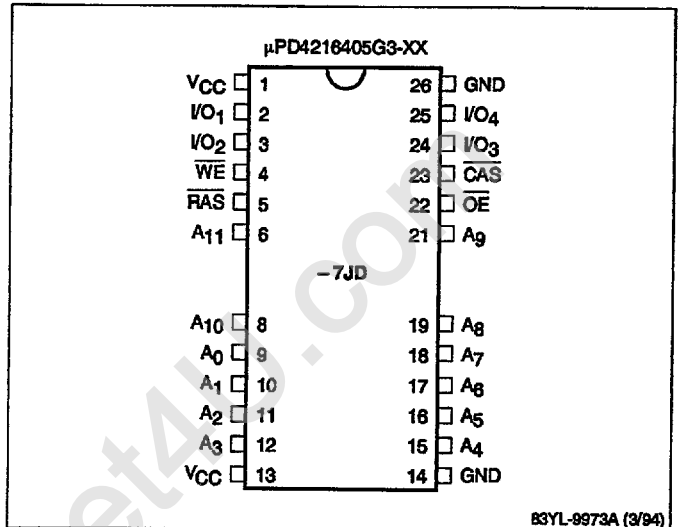
- 4,194,152 word x 4-bit organization
- Low power dissipation/active
  - 550 mW max (μPD4216405-50)
  - 495 mW max (μPD4216405-60)
  - 440 mW max (μPD4216405-70)
- Low power dissipation/standby
  - 5.5 mW max (CMOS level)
- Single power supply (+5-volt ±10%)
- On-chip substrate bias generator
- Multiplexed address inputs
- Non-latched I/O, TTL-compatible
- 4096 refresh cycles every 64 ms
- $\overline{\text{RAS}}$ -only refresh, hidden refresh, and  $\overline{\text{CAS}}$  before  $\overline{\text{RAS}}$  internal address refresh
- Hyper-page mode, read/write cycle

**Pin Identification**

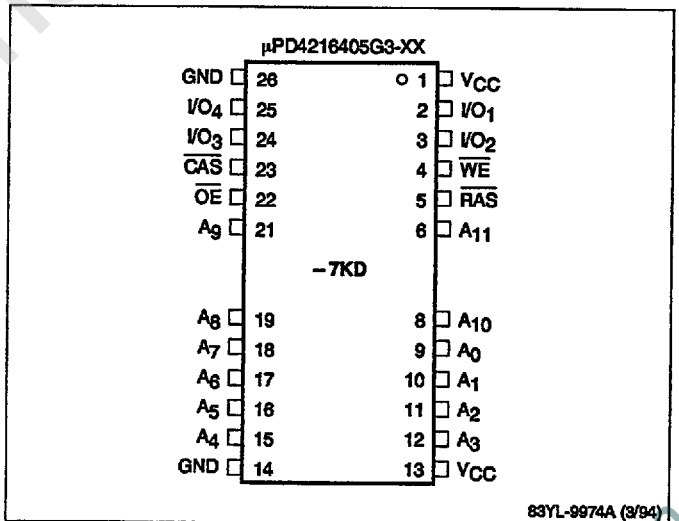
Name	Function
$A_0 - A_{11}$	Address inputs
$I/O_1 - I/O_4$	Data inputs/outputs
$\overline{\text{RAS}}$	Row address strobe
$\overline{\text{CAS}}$	Column address strobe
$\overline{\text{WE}}$	Write enable
$\overline{\text{OE}}$	Output enable
$V_{CC}$	Power supply
GND	Ground
NC	No connection

**Pin Configurations**

**26-Pin Plastic TSOP (300 mil)**

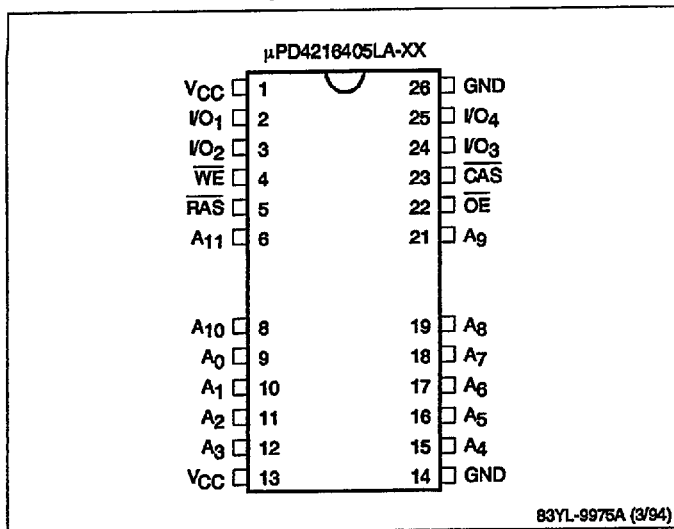


**26-Pin Plastic TSOP (300 mil, reverse bent)**



Pin Configurations

26-Pin Plastic SOJ (300 mil)



Ordering Information

Part Number	Access Time (max)	R/W Cycle (min)	Hyper-Page Mode (min)	Package	Refresh
μPD4216405G3-50-7JD	50 ns	84 ns	20 ns	26-pin plastic TSOP (300 mil)	CAS before RAS refresh; RAS only refresh; hidden refresh
μPD4216405G3-60-7JD	60 ns	104 ns	25 ns		
μPD4216405G3-70-7JD	70 ns	124 ns	30 ns		
μPD4216405G3-50-7KD	50 ns	84 ns	20 ns	26-pin plastic TSOP (300 mil) (reverse bent)	
μPD4216405G3-60-7KD	60 ns	104 ns	25 ns		
μPD4216405G3-70-7KD	70 ns	124 ns	30 ns		
μPD4216405LA-50	50 ns	84 ns	20 ns	26-pin plastic SOJ (300 mil)	
μPD4216405LA-60	60 ns	104 ns	25 ns		
μPD4216405LA-70	70 ns	124 ns	30 ns		

Note: Devices are standard grade quality.

## Block Diagram

