# HM100422,HM100422F
# HM100422CG

**256-word×4-bit Fully Decoded Random Access Memory**

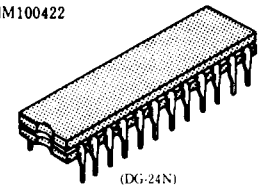
The HM100422 is ECL 100K compatible, 256-word x 4-bit, read write, random access memory developed for high speed system such as scratch pads and control/buffer storages.

Four active Low Block Select lines are provided to select each block independently.

The fabrication process is the Hitachi's low capacitance, oxide isolation method with double metalization.

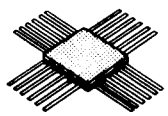
The HM100422 is encapsulated in cerdip-24pin package, or 24pin flat package compatible with Fairchild's F100422.

HM100422



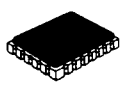
(DG-24N)

HM100422F



(FG-24)

HM100422CG



(CG-24)

## ■FEATURES

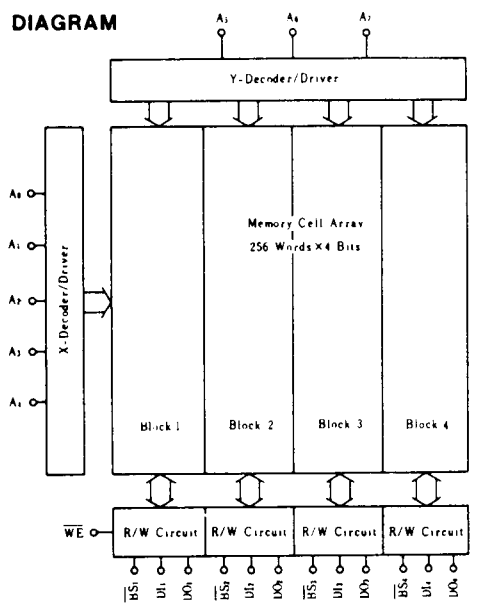
- 256-word x 4-bit organization
- Fully compatible with 100K ECL level
- Address access time: 10ns (max.)
- Minimum write pulse width: 6ns (min.)
- Low power dissipation: 0.8mW/bit
- Output obtainable by wired-OR (open emitter)

## ■TRUTH TABLE

| Input | | | Output | Mode |
|---|---|---|---|---|
| $\overline{BS}$ | $\overline{WE}$ | Din | | |
| H | × | × | L | Not Selected |
| L | L | L | L | Write "0" |
| L | L | H | L | Write "1" |
| L | H | × | Dout* | Read |

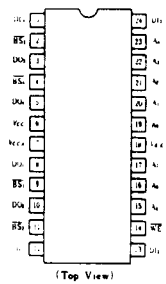
Notes) × : Irrelevant
* : Read Out Noninvert

## ■BLOCK DIAGRAM



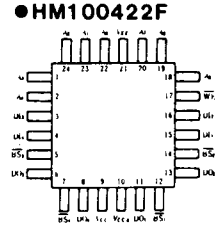

## ■PIN ARRANGEMENT

### ●HM100422



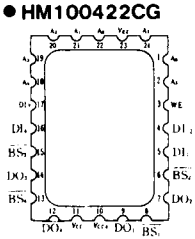
(Top View)

### ●HM100422F



(Top View)

### ●HM100422CG





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## ■ABSOLUTE MAXIMUM RATINGS ($Ta$=25°C)

| Item | Symbol | Rating | Unit |
|---|---|---|---|
| Supply Voltage | $V_{EE}$ to $V_{CC}$ | +0.5 to −7.0 | V |
| Input Voltage | $V_{in}$ | +0.5 to $V_{EE}$ | V |
| Output Current | $I_{out}$ | −30 | mA |
| Storage Temperature | $T_{stg}$ | −65 to +150 | °C |
| Storage Temperature | $T_{stg}$(Bias)* | −55 to +125 | °C |

* Under Bias

## ■ELECTRICAL CHARACTERISTICS

### ●DC CHARACTERISTICS ($V_{EE}$ = −4.5V, $R_L$=50Ω to −2.0V, $Ta$=0 to +85°C, air flow exceeding 2m/sec)

| Item | Symbol | Test Condition | | min(B) | typ | max(A) | Unit |
|---|---|---|---|---|---|---|---|
| Output Voltage | $V_{OH}$ | $V_{in}$=$V_{IHA}$ or $V_{ILB}$ | | −1025 | −955 | −880 | mV |
| | $V_{OL}$ | | | −1810 | −1715 | −1620 | mV |
| Output Threshold Voltage | $V_{OHC}$ | $V_{in}$=$V_{IHB}$ or $V_{ILA}$ | | −1035 | — | — | mV |
| | $V_{OLC}$ | | | — | — | −1610 | mV |
| Input Voltage | $V_{IH}$ | Guaranteed Input Voltage High/Low for All Inputs | | −1165 | — | −880 | mV |
| | $V_{IL}$ | | | −1810 | — | −1475 | mV |
| Input Current | $I_{IH}$ | $V_{in}$=$V_{IHA}$ | | — | — | 220 | μA |
| | $I_{IL}$ | $V_{in}$=$V_{ILB}$ | $\overline{BS}$ | 0.5 | — | 170 | μA |
| | | | Others | −50 | — | — | |
| Supply Current | $I_{EE}$ | All Inputs and Outputs Open | | −200 | −165 | — | mA |

### ●AC CHARACTERISTICS ($V_{EE}$ = −4.5V ±5%, $Ta$=0 to +85°C, air flow exceeding 2m/sec)

1. READ MODE

| Item | Symbol | Test Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Block Select Access Time | $t_{ABS}$ | | — | — | 6 | ns |
| Block Select Recovery Time | $t_{RBS}$ | | — | — | 5 | ns |
| Address Access Time | $t_{AA}$ | | — | 7 | 10 | ns |

2. WRITE MODE

| Item | Symbol | Test Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Write Pulse Width | $t_W$ | $t_{WSA}$=2ns | 6 | 4.5 | — | ns |
| Data Setup Time | $t_{WSD}$ | | 2 | 0 | — | ns |
| Data Hold Time | $t_{WHD}$ | | 2 | 0 | — | ns |
| Address Setup Time | $t_{WSA}$ | $t_W$=6ns | 2 | 0 | — | ns |
| Address Hold Time | $t_{WHA}$ | | 2 | 0 | — | ns |
| Block Select Setup Time | $t_{WSBS}$ | | 2 | 0 | — | ns |
| Block Select Hold Time | $t_{WHBS}$ | | 2 | 0 | — | ns |
| Write Disable Time | $t_{WS}$ | | — | 4 | 6 | ns |
| Write Recovery Time | $t_{WR}$ | | — | 4.5 | 12 | ns |

3. RISE/FALL TIME

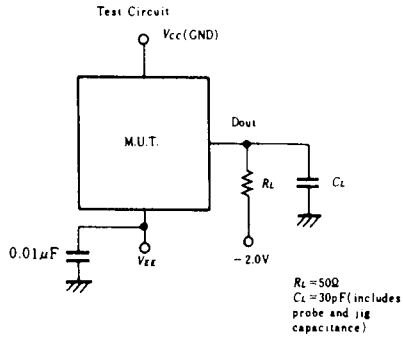
| Item | Symbol | Test Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Output Rise Time | $t_r$ | | — | 2 | — | ns |
| Output Fall Time | $t_f$ | | — | 2 | — | ns |

4. CAPACITANCE

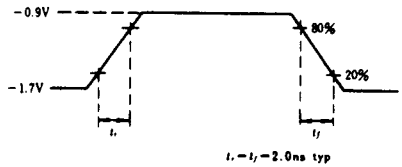
| Item | Symbol | Test Condition | min | typ | max | Unit |
|---|---|---|---|---|---|---|
| Input Capacitance | $C_{in}$ | | — | 4 | — | pF |
| Output Capacitance | $C_{out}$ | | — | 7 | — | pF |

## ■ TEST CIRCUIT AND WAVEFORMS

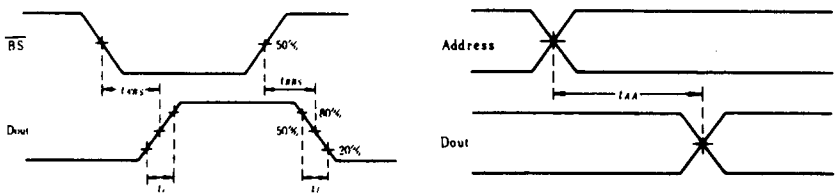
1. LOADING CONDITION




2. INPUT PULSE




3. READ MODE




4. WRITE MODE