HN613128P, HN613128FP

16384-word×8-bit Mask Programmable Read Only Memory

The HN613128P/FP is a mask-programmable, byte-organized memory designed for use in bus-organized systems. To facilitate use, the device operates from a single power supply, has compatibility with TTL, and requires no clocks or refreshing because of static operation. The active level of the CS, OE_0, OE_1 input and the memory content are defined by the user. The Chip Select input deselects the output and puts the chip in a power-down mode.

HN613128P

(DP-28)

HN613128FP

(FP-54)

■ FEATURES

- Fully Static Operation
- Automatic Power Down
- Single +5-Volt Power Supply
- Three-State Data Output for OR-Ties
- Mask Programmable Chip Select, Output Enable
- TTL Compatible
- Maximum Access Time; 250ns
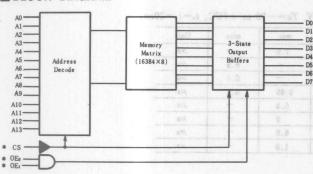- Low Power Standby and Low Power Operation;
    - Standby: 5μW (typ.)
    - Operation: 50mW (typ.)
- Pin Compatible with EPROM

■ BLOCK DIAGRAM

Address Decode

Memory Matrix (16384×8)

3-State Output Buffers

A0, A1, A2, A3, A4, A5, A6, A7, A8, A9, A10, A11, A12, A13

D0, D1, D2, D3, D4, D5, D6, D7

* CS
* OE_0
* OE_1

* Active level defined by the user.

■ PIN ARRANGEMENT

● HN613128P

NC	1		28	V_{CC}
A_{12}	2		27	OE_1 *
A_7	3		26	A_{13}
A_6	4		25	A_8
A_5	5		24	A_9
A_4	6		23	A_{11}
A_3	7		22	OE_0 *
A_2	8		21	A_{10}
A_1	9		20	CS *
A_0	10		19	D_7
D_0	11		18	D_6
D_1	12		17	D_5
D_2	13		16	D_4
V_{SS}	14		15	D_3

(Top View)

● HN613128FP

(Top View)

■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Value	Unit
Supply Voltage*	V_{CC}	−0.3 to +7.0	V
Input Voltage*	V_{in}	−0.3 to +7.0	V
Operating Temperature Range	T_{opr}	−20 to +75	°C
Storage Temperature Range	T_{stg}	−55 to +125	°C
Storage Temperature Range (under bias)	T_{bias}	−20 to +85	°C

* With respect to V_{SS}.

■ RECOMMENDED DC OPERATING CONDITIONS

Item	Symbol	min.	typ.	max.	Unit
Supply Voltage *	V_{CC}	4.5	5.0	5.5	V
Input Voltage*	V_{IL}	−0.3	—	0.8	V
	V_{IH}	2.2	—	V_{CC}	V
Operating Temperature	T_{opr}	−20	—	75	°C

* With respect to V_{SS}.

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■ ELECTRICAL CHARACTERISTICS ($V_{CC}=5.0V\pm10\%$, $V_{SS}=0V$, $Ta=-20$ to $+75°C$)

Item	Symbol	Test Condition	min	typ	max	Unit
Input High-level Voltage	V_{IH}		2.2	—	V_{CC}	V
Input Low-level Voltage	V_{IL}		−0.3	—	0.8	V
Output High-level Voltage	V_{OH}	$I_{OH}=-205\mu A$	2.4	—	—	V
Output Low-level Voltage	V_{OL}	$I_{OL}=3.2mA$	—	—	0.4	V
Input Leakage Current	I_{in}	$V_{in}=0$ to $5.5V$	—	—	2.5	μA
Output High-level Leakage Current	I_{LOH}	$V_{out}=2.4V$, $CS=0.8V$, $\overline{CS}=2.2V$	—	—	10	μA
Output Low-level Leakage Current	I_{LOL}	$V_{out}=0.4V$, $CS=0.8V$, $\overline{CS}=2.2V$	—	—	10	μA
Supply Current (Active/Standby)	I_{CC}^*/I_{sb}	$V_{CC}=5.5V$, $I_{DOUT}=0mA$ /$\overline{CS}\geq V_{CC}-0.2V$, $CS\leq0.2V$	—	10/1	25/30	mA /μA
Input Capacitance	C_{in}	$V_{in}=0V$, $f=1.0MHz$, $Ta=25°C$	—	—	10	pF
Output Capacitance	C_{out}	$V_{in}=0V$, $f=1.0MHz$, $Ta=25°C$	—	—	15	pF

* Steady state current
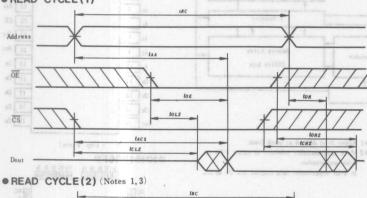
■ RECOMMENDED AC OPERATING CONDITIONS (READ SEQUENCE)

($V_{CC}=5.0V\pm10\%$, $V_{SS}=0V$, $Ta=-20$ to $+75°C$, All timing with $t_r=t_f=20ns$)

Item	Symbol	HN613128P min	HN613128P max	Unit
Read Cycle Time	t_{RC}	250	—	ns
Address Access Time	t_{AA}	—	250	ns
Chip Select Access Time	t_{ACS}	—	250	ns
Chip Selection to Output in Low Z	t_{CLZ}	10	—	ns
Output Enable to Output Valid	t_{OE}	—	100	ns
Output Enable to Output in Low Z	t_{OLZ}	10	—	ns
Chip deselection to Output in High Z	t_{CHZ}	0	100	ns
Chip Disable to Output in High Z	t_{OHZ}	0	100	ns
Output Hold from Address Change	t_{OH}	10	—	ns

■ TIMING WAVEFORM
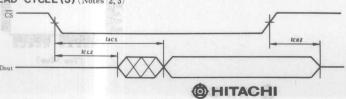
● READ CYCLE (1)

● READ CYCLE (2) (Notes 1, 3)
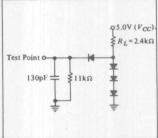

● READ CYCLE (3) (Notes 2, 3)

● AC TEST LOAD

Notes) 1. $t_r=t_f=20ns$.
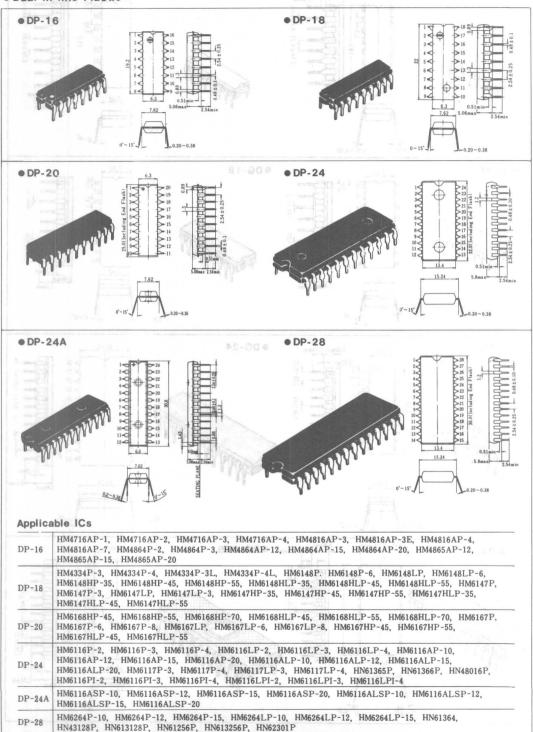2. C_L includes jig capacitance.
3. All diodes are 1S2074⊕.

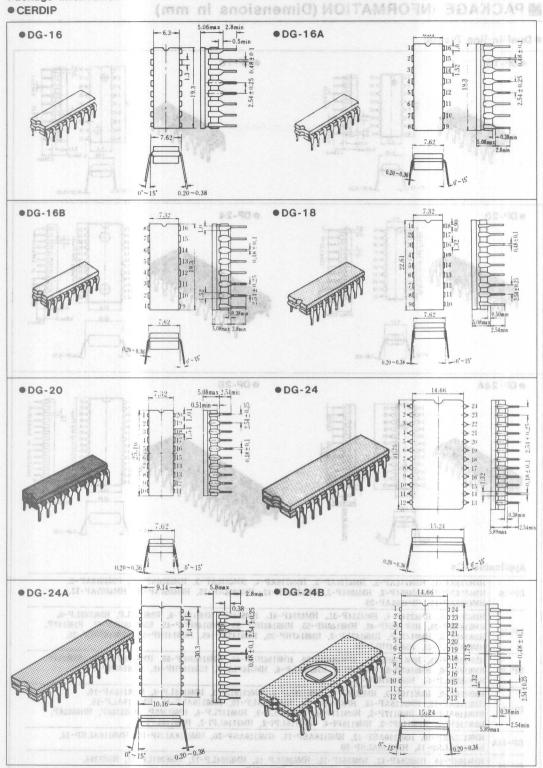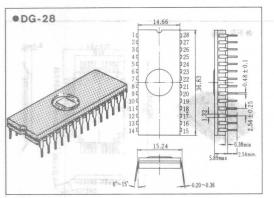NOTES:
1. Device is continuously selected.
2. Address Valid prior to or coincident with $\overline{CS}$ transition low.
3. $\overline{OE}=V_{IL}$.

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● Dual-in-line Plastic

● DP-16

● DP-18

● DP-20

● DP-24

● DP-24A

● DP-28

Applicable ICs

DP-16	HM4716AP-1, HM4716AP-2, HM4716AP-3, HM4716AP-4, HM4816AP-3, HM4816AP-3E, HM4816AP-4, HM4816AP-7, HM4864P-2, HM4864P-3, HM4864AP-12, HM4864AP-15, HM4864AP-20, HM4865AP-12, HM4865AP-15, HM4865AP-20
DP-18	HM4334P-3, HM4334P-4, HM4334P-3L, HM4334P-4L, HM6148P. HM6148P-6, HM6148LP, HM6148LP-6, HM6148HP-35, HM6148HP-45, HM6148HP-55, HM6148HLP-35, HM6148HLP-45, HM6148HLP-55, HM6147P, HM6147P-3, HM6147LP, HM6147LP-3, HM6147HP-35, HM6147HP-45, HM6147HP-55, HM6147HLP-35, HM6147HLP-45, HM6147HLP-55
DP-20	HM6168HP-45, HM6168HP-55, HM6168HP-70, HM6168HLP-45, HM6168HLP-55, HM6168HLP-70, HM6167P, HM6167P-6, HM6167P-8, HM6167LP, HM6167LP-6, HM6167LP-8, HM6167HP-45, HM6167HP-55, HM6167HLP-45, HM6167HLP-55
DP-24	HM6116P-2, HM6116P-3, HM6116P-4, HM6116LP-2, HM6116LP-3, HM6116LP-4, HM6116AP-10, HM6116AP-12, HM6116AP-15, HM6116AP-20, HM6116ALP-10, HM6116ALP-12, HM6116ALP-15, HM6116ALP-20, HM6117P-3, HM6117P-4, HM6117LP-3, HM6117LP-4, HN61365P, HN61366P, HN48016P, HM6116PI-2, HM6116PI-3, HM6116PI-4, HM6116LPI-2, HM6116LPI-3, HM6116LPI-4
DP-24A	HM6116ASP-10, HM6116ASP-12, HM6116ASP-15, HM6116ASP-20, HM6116ALSP-10, HM6116ALSP-12, HM6116ALSP-15, HM6116ALSP-20
DP-28	HM6264P-10, HM6264P-12, HM6264P-15, HM6264LP-10, HM6264LP-12, HM6264LP-15, HN61364, HN43128P, HN613128P, HN61256P, HN613256P, HN62301P

● DG-16 ● DG-16A

● DG-16B ● DG-18

● DG-20 ● DG-24

● DG-24A ● DG-24B

◎ **HITACHI**

● DG-28

Applicable ICs

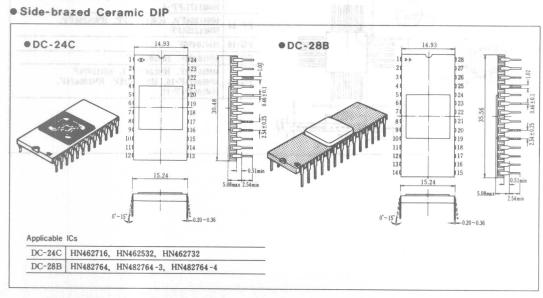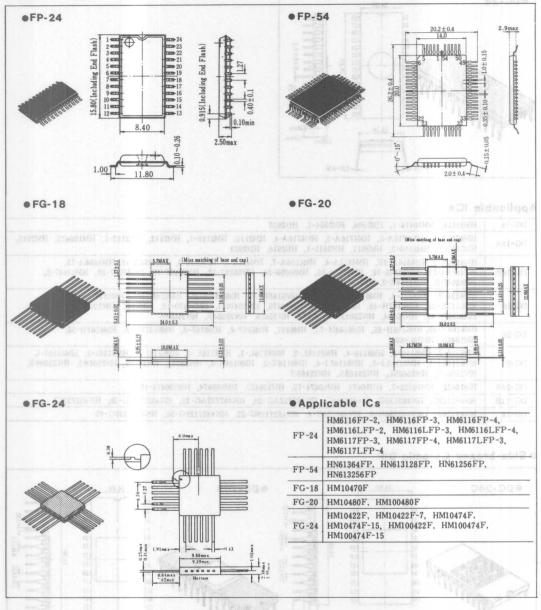|	
DG-16	HM10414, HM10414-1, HM2504, HM2504-1, HD2912
DG-16A	HM4716A-1, HM4716A-2, HM4716A-3, HM4716A-4, HM2110, HM2110-1, HM2112, HM2112-1, HM100415, HM2510, HM2510-1, HM2510-2, HM2511, HM2511-1, HD2916, HD2923
DG-16B	HM4816A-3, HM4816A-3E, HM4816A-4, HM4816A-7, HM4864-2, HM4864-3, HM4864A-12, HM4864A-15, HM4864A-20, HM50256-12, HM50256-15, HM50256-20, HM50257-12, HM50257-15, HM50257-20, HM4864I-2, HM4864I-3, HM4864K-2, HM4864K-3
DG-18	HM4334-3, HM4334-4, HM6148, HM6148-6, HM6148H-35, HM6148H-45, HM6148H-55, HM6147, HM6147-3, HM6147H-35, HM6147H-45, HM6147H-55, HM10470, HM10470-1, HM10470-15, HM2142, HM100470, HM100470-15, HN25044, HN25045, HN25084, HN25085, HN25084S, HN25085S
DG-20	HM6168H-45, HM6168H-55, HM6168H-70, HM6167, HM6167-6, HM6167-8, HM6167H-45, HM6167H-55, HM10480, HM100480
DG-24	HM6116-2, HM6116-3, HM6116-4, HM6116L-2, HM6116L-3, HM6116L-4, HM6116I-2, HM6116I-3, HM6116I-4, HM6116LI-2, HM6116LI-3, HM6116LI-4, HM6116K-3, HM6116K-4, HN25088, HN25089, HN25088S, HN25089S, HN25088L, HN25089L, HN25168S, HN25169S
DG-24A	HM10422, HM10422-7, HM10474, HM10474-15, HM100422, HM100474, HM100474-15
DG-24B	HN462716G, HN462532G, HN462732G, HN482732AG-20, HN482732AG-25, HN482732AG-30, HN462732GI
DG-28	HN482764G, HN482764G-3, HN482764G-4, HN4827128G-25, HN4827128G-30, HN4827128G-45

● Side-brazed Ceramic DIP

● DC-24C

● DC-28B

Applicable ICs

DC-24C	HN462716, HN462532, HN462732
DC-28B	HN482764, HN482764-3, HN482764-4

● **Flat Packages**

● **FP-24**

● **FP-54**

● **FG-18**

(Miss matching of base and cap)

● **FG-20**

(Miss matching of base and cap)

● **FG-24**

● **Applicable ICs**

FP-24	HM6116FP-2, HM6116FP-3, HM6116FP-4, HM6116LFP-2, HM6116LFP-3, HM6116LFP-4, HM6117FP-3, HM6117FP-4, HM6117LFP-3, HM6117LFP-4
FP-54	HN61364FP, HN613128FP, HN61256FP, HN613256FP
FG-18	HM10470F
FG-20	HM10480F, HM100480F
FG-24	HM10422F, HM10422F-7, HM10474F, HM10474F-15, HM100422F, HM100474F, HM100474F-15

◉ **HITACHI**

● Leadless Chip Carrier

● CC-18

● CC-24

● CG-18

● CG-20

● CG-32

● Applicable ICs

CC-18	HM4864CC-2, HM4864CC-3
CC-24	HM100415CC, HM100422CC
CG-18	HM4864ACG-12, HM4864ACG-15 HM4864ACG-20
CG-20	HM6167HCG-45, HM6167HCG-55
CG-32	HM6116CG-2, HM6116CG-3, HM6116CG-4