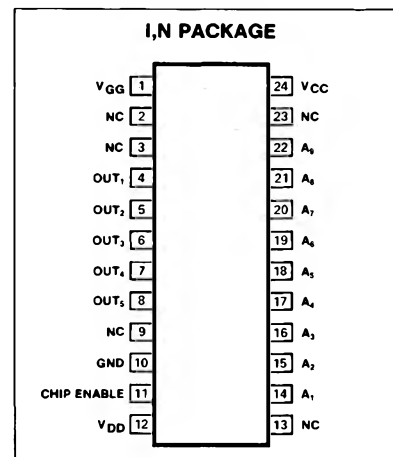
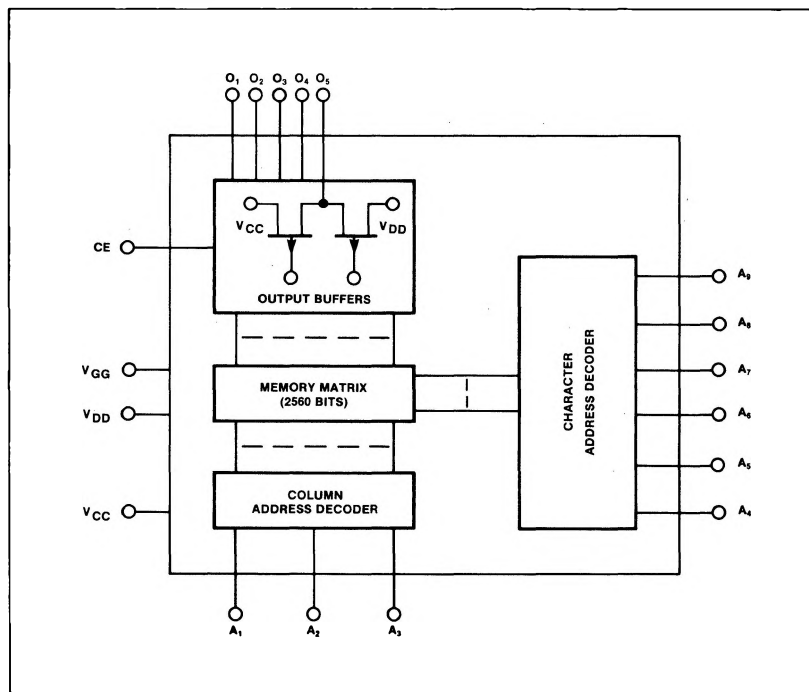


FEATURES

- Standard 7X5 dot matrix fits well
- TTL level interface signals
- Tri-state outputs
- Direct, low cost interfacing with TTL, DTL, CMOS and Signetics MOS 2500 series

TRUTH TABLE

CE	OUTPUT
0	Data
1	Open

PIN CONFIGURATION**BLOCK DIAGRAM****ABSOLUTE MAXIMUM RATINGS¹**

PARAMETER	RATING	UNIT
T_A Temperature range		°C
T_{STG} Operating	0 to 70	
P_D Storage	-65 to 150	
Power dissipation at $T_A = 70^\circ\text{C}$ ²	730	mW
Input ³ and supply voltages with respect to V_{CC}	0.3 to -20	V

DC ELECTRICAL CHARACTERISTICS

$T_A = 0^\circ\text{C}$ to 70°C , $V_{CC} = 5\text{V} \pm 5\%$, $V_{DD} = -5\text{V} \pm 5\%$,
 $V_{GG} = -12\text{V} \pm 5\%$ unless otherwise specified. 4,5,6,7

PARAMETER		TEST CONDITIONS	LIMITS			UNIT
			Min	Typ	Max	
V_{IL} V_{IH}	Input voltage ⁸ Low High		3.4		0.6 5.3	V
V_{OL} V_{OH}	Output voltage Low High	One TTL load	-5 3.0		0.4	V
I_{LI} I_{LO}	Input load current Output leakage current	$V_{IN} = -5.5V, T_A = 25^{\circ}C$ $V_{OUT} = -5.5V, T_A = 25^{\circ}C, V_{CE} = V_{CC}$		10 10	500 1000	nA nA
I_{DD} I_{GG}	Supply current V_{DD} V_{GG}	Outputs open $V_{CE} = V_{CC}$		12 10	15 25	mA
C_{IN}	Capacitance Address input	$f = 1MHz, V_{IH} = V_{CC}, 25mV$ p-p			10	pF

AC ELECTRICAL CHARACTERISTICS

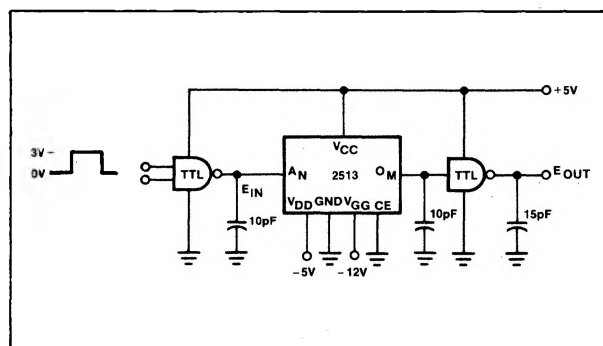
$T_A = 0^\circ\text{C}$, to 70°C , $V_{CC} = 5\text{V} \pm 5\%$, $V_{DD} = -5\text{V} \pm 5\%$, $V_{GG} = -12\text{V} \pm 5\%$,
unless otherwise specified.

PARAMETER	TO	FROM	TEST CONDITIONS	LIMITS			UNIT
				Min	Typ	Max	
t_{CA} t_{RA} t_{CE}			See ac test setup		500 450 150	600 500	ns
	Output	Chip enable					

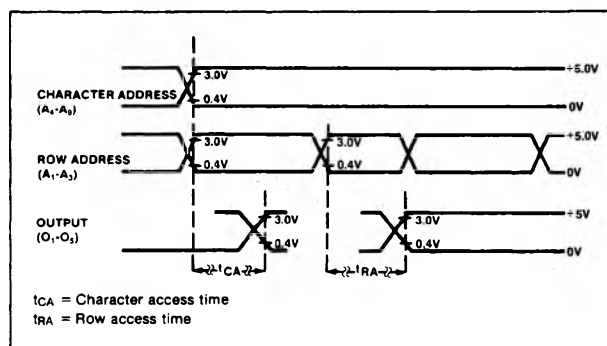
NOTES

- Stresses 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 at any other condition above those indicated in the operational sections of this specification is not implied.
- For operating at elevated temperatures the device must be derated on a $+150^\circ\text{C}$ maximum junction temperature and a thermal resistance of 110°C/W junction to ambient.
- All inputs are protected against static charge.
- Parameters are valid over operating temperature range unless specified.
- All voltage measurements are referenced to ground.
- Manufacturer reserves the right to make design and process changes and improvements.
- Typical values at $+25^\circ\text{C}$ and typical supply voltages.
- Guaranteed input levels are stated for worst case conditions including a $\pm 5\%$ variation in V_{CC} and a temperature variation of 0°C to $+70^\circ\text{C}$. Actual input requirements with respect to V_{CC} are $V_{IH} = V_{CC} - 1.85\text{V}$ and $V_{IL} = V_{CC} - 4.15\text{V}$.

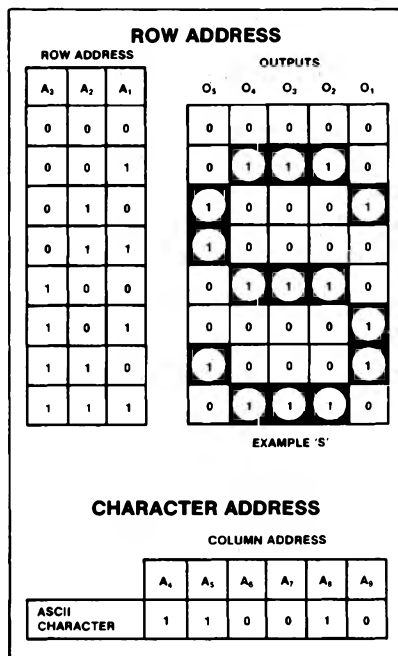
TEST LOAD CIRCUIT



TIMING DIAGRAM



CHARACTER FORMAT



ORGANIZATION AS CHARACTER GENERATOR

A 6-bit binary address (A₄-A₉) selects 1-of-64 matrix characters arranged 5 dots horizontally and 8 dots vertically. A 3-bit binary address code (A₁-A₃) selects 1 of 8 rows. Five outputs display a complete row of the character matrix (see Row Address Character Format). The devices may also be used in pairs to provide 9X7 and 10X8 vertical scan formats.

ORGANIZATION AS ROM

For a straight 512X5 ROM, the 5 outputs will display any one of 512 5-bit stored words corresponding to a 9-bit address applied to A₁-A₉.

CUSTOM DEVICES

For unique custom memory patterns, this form should be used to transmit coding instructions. The nomenclature for a custom device will consist of the basic product type followed by a unique CM number assigned by Signetics, i.e., 2513N/CM2141.

- Programming with punched cards:
For maximum accuracy and minimum cost and turn-around time, the truth table should be transmitted to Signetics in the form of punched cards according to the format indicated on the following pages.

VERIFICATION

Upon receipt of either punched card or written truth table information, Signetics will prepare a computer tabulation of the instructions and return to the address indicated. If errors are detected, they should be transmitted to Signetics as quickly as possible.

LOGIC CONVENTION

Logic "1"s or blackened squares in the truth table will result in high output from the indicated output terminal, i.e., 3.2V minimum. Similarly, a "1" address input level is interpreted as 3.2V minimum.

CARD FORMAT

IDENTIFICATION CARDS

Indicates comment card Leave columns 22, 23, 24, 25 blank for assignment of CM No. by Signetics Customer P/N identification

Basic part type

1 SIGNETICS 2513N/CM PUNCH MEMORIES P/N 132214-1

Person responsible for reviewing Signetics computer generated truth table

1 WITH SIGNETICS P/N 132214-1

Street address

1 2560 WINING PEAR

City State Zip

1 SIGNETICS CALIFORNIA 94026

Company name

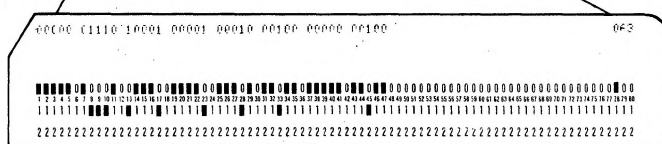
1 PUNCH MEMORIES INC.

CARD FORMAT (Cont'd)

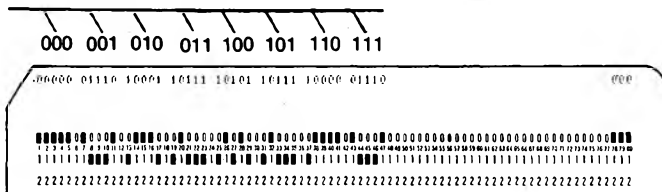
DATA CARDS

Outputs $0_5 - 0_1$ respectively

Character number
(Data card number)

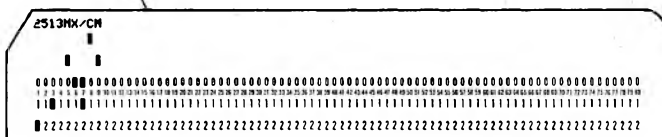


Row address



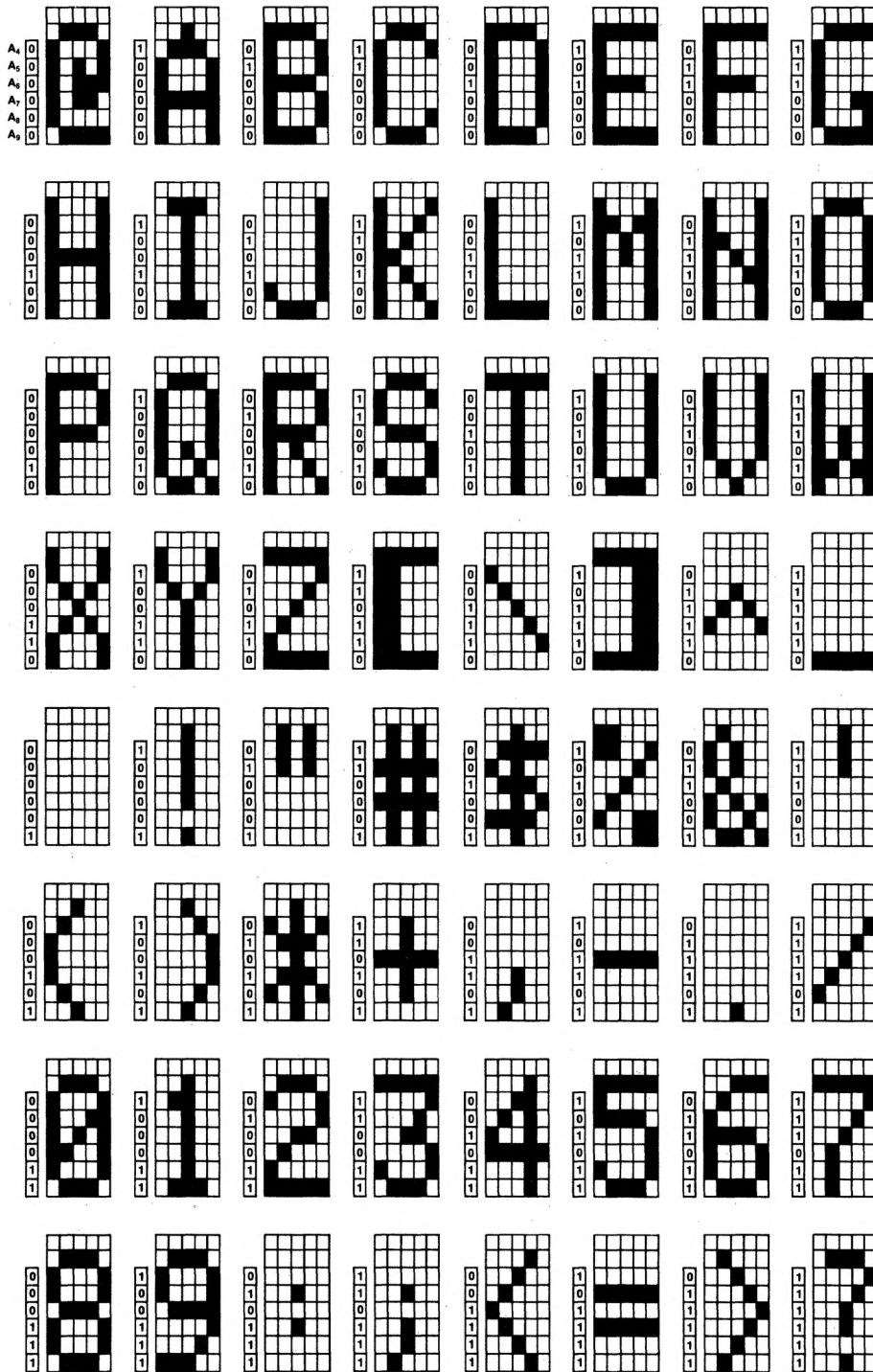
Basic device type

Leave columns 10, 11, 12, 13 blank for assignment of CM No. by Signetics



Character number is in columns 78, 79 and 80. Note that each group of 5-bit words is treated as a character for convenience of coding.

ASCII CHARACTER FONT



For upper case order CM2140; For lower case order CM3021.