signetics

HIGH SPEED 64 X 6 X 8 STATIC CHARACTER GENERATOR | 2516

SILICON GATE MOS 2500 SERIES

DESCRIPTION

The Signetics 2516 is a high speed 3072-bit Static ROM available in a 64 x 6 x 8 organization. The product uses +5V, -5V and -12V power supplies, 5V TTL level input signals and Tri-State-Outputs for direct, low cost interfacing with TTL, DTL and 2500 Series MOS.

FEATURES

- COLUMN OUTPUT
- 450 ns TYPICAL ACCESS TIME
- STATIC OPERATION
- TTL/DTL COMPATIBLE INPUTS
- +5, -5, -12V POWER SUPPLIES
- TRI-STATE OUTPUT CONTROLLED BY CHIP ENABLE FOR POWERFUL BUSSING CAPABILITY
- 2516/CM 2150 ASCII FONT STANDARD (5 x 7)
- OPTIONAL SEPARATE OUTPUT V_{DD} FOR POWER REDUCTION
- OPTIONAL CHIP ENABLE "2" FOR 4 BIT WORD ORGANIZATION
- 24-PIN DIP PACKAGE
- SIGNETICS P-MOS SILICON GATE PROCESS TECHNOLOGY

APPLICATIONS

VERTICAL SCAN CRT DISPLAYS (COLUMN OUTPUT)
PRINTER CHARACTER GENERATOR
PANEL DISPLAYS AND BILLBOARDS
MICRO-PROGRAMMING
CODE CONVERSION

PROCESS TECHNOLOGY

The use of Signetics' unique Silicon Gate Low Threshold Process allows the design and production of higher functional density and operating speed than other techniques.

BIPOLAR COMPATIBILITY

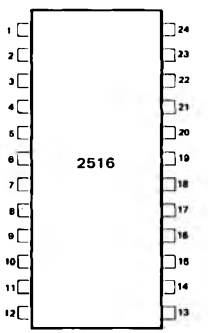
All inputs of the 2516 can be driven directly by standard bipolar integrated circuits (TTL, DTL, etc.). The data output buffers are capable of sinking a minimum of 1.6mA, sufficient to drive one standard TTL load.

SILICONE PACKAGING

Low cost silicone DIP packaging is implemented and reliability is assured by the use of Signetics unique silicon gate MOS process technology. Unlike the standard metal gate MOS process the silicon material over the gate oxide passivates the MOS transistors. In addition, Signetics proprietary surface passivation and silicone packaging techniques result in an MOS circuit with inherent high reliability, superior moisture resistance, and ionic contamination barriers. For further information reference Signetics - "Silicone Package Qualification Report."

PIN CONFIGURATION (Top View)

N/I PACKAGE



1.	Chip Enable	24.	V_{CC}
2.	NC	23.	V_{GG}
3.	Output 8	22.	Address 9
4.	Output 7	21.	Address 8
5.	Output 6	20.	Address 7
6.	Output 5	19.	Address 6
7.	Output 4	18.	Address 5
8.	Output 3	17.	Address 4
9.	Output 2	16.	Address 3
10.	Output 1	15.	Address 2
11.	Ground	14.	Address 1
12.	V_{DD}	13.	NC

PART IDENTIFICATION TABLE

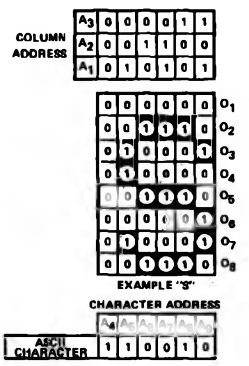
PART	ORGANIZATION	PROGRAMMING
2516N/I CM 2150	64 x 6 x 8	ASCII Font
2516N/I CMXXXX	64 x 6 x 8	Custom*

*Ask for "Signetics 2516 Read-Only-Memory Software Package"

MAXIMUM GUARANTEED RATINGS (1)

Operating Ambient Temperature	0°C to 70°C
Storage Temperature	-65°C to +150°C
Package Power Dissipation(2) @ 70°C	730 mW
Input(3) and Supply Voltages with respect to V_{CC}	+0.3 to -20V

CHARACTER FORMAT



NOTE:
Undefined (column) addresses result in "1" level (high) outputs.

NOTES:

1. Stresses above those listed under "Maximum Guaranteed Rating" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.
2. For operating at elevated temperatures the device must be derated based on a +150°C maximum junction temperature and a thermal resistance of 110°C/W junction to ambient.
3. All inputs are protected against static charge.
4. Parameters are valid over operating temperature range unless specified.
5. All voltage measurements are referenced to ground.
6. Manufacturer reserves the right to make design and process changes and improvements.
7. Typical values are at +25°C and nominal supply voltages.
8. V_{CC} tolerance is ±5%. Any variation in actual V_{CC} will be tracked directly by V_{IL}, V_{IH}, and V_{OH} which are stated for a V_{CC} of exactly 5 volts.

DC CHARACTERISTICS

T_A = 0°C to +70°C; V_{CC} = +5V; V_{DD} = -5V ±5%; V_{GG} = -12V ±5%; unless otherwise noted. (Notes 4, 5, 6, 7)

SYMBOL	TEST	MIN	TYP	MAX	UNIT	CONDITIONS
I_{LI}	Input Load Current		10	500	nA	V_{IN} = -5.5V T_A = 25°C
I_{LO}	Output Leakage Current		10	1000	nA	V_{OUT} = -5.5V T_A = 25°C
I_{DD}	V_{DD} Power Supply Current		14	21	mA	V_{CE} = V_{CC} Outputs Open
I_{GG}	V_{GG} Power Supply Current		8	12	mA	Outputs Open
V_{IL}	Input Logic "0"	-5		1.05	V	
V_{IH}	Input Logic "1"	3.2		5.3	V	

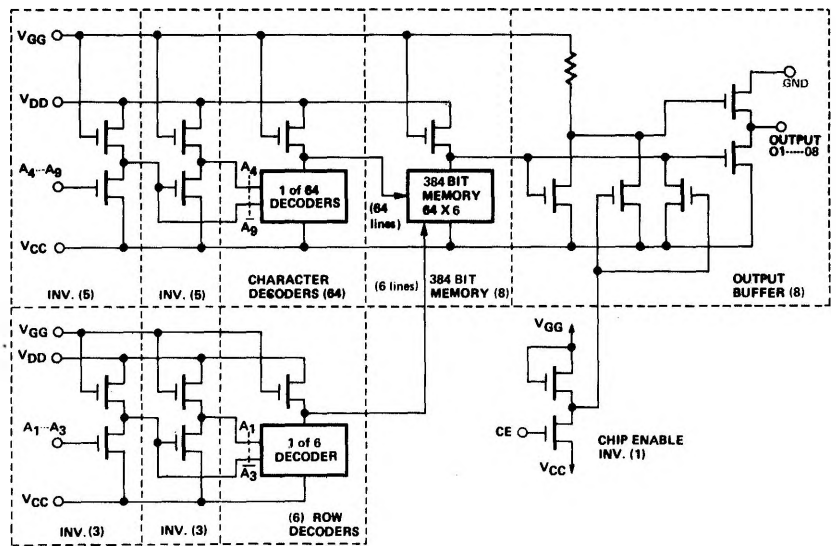
AC CHARACTERISTICS

T_A = 0°C to +70°C; V_{CC} = 5V(8); V_{DD} = -5%; V_{GG} = -12V +5%; unless otherwise noted.

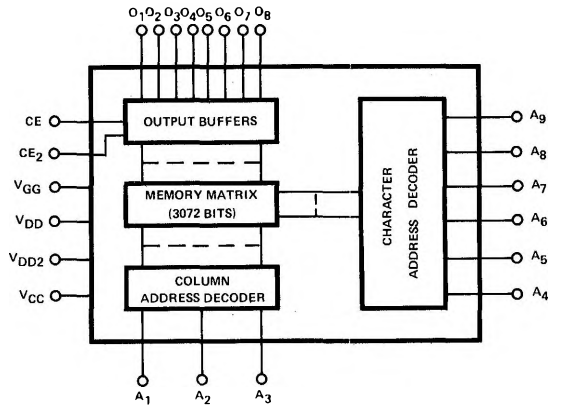
SYMBOL	TEST	MIN	TYP	MAX	UNIT	CONDITIONS
V_{OL}	Output Logic "Zero"	-5		0.8	V	One TTL Load
V_{OH}	Output Logic "One"	3.0			V	One TTL Load
t_{CA}	Character Access Time		500	600	ns	See AC Test Setup*
t_{CA}	Column Access Time (A_1 - A_3)		400	500	ns	See AC Test Setup*
C_{IN}	Address Input Capacitance			10	pF	f = 1MHz, V_{IH} = V_{CC}, 25mV p-p

*T_A=0°C to +70°C

CIRCUIT SCHEMATIC



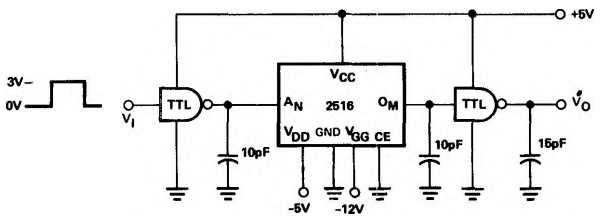
BLOCK DIAGRAM



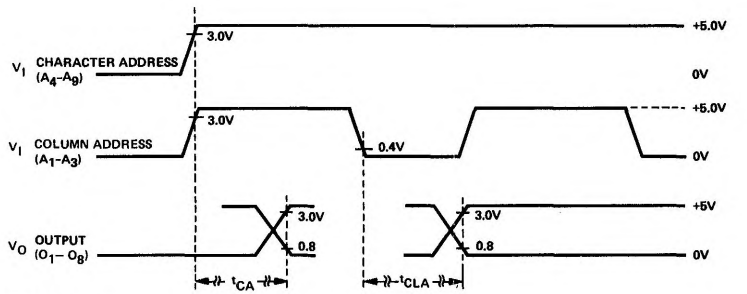
Note: For 4-Bit organization Chip Enable 1 controls $O_1 - O_4$, Chip Enable 2 controls $O_5 - O_8$.

CE	OUTPUT
0	DATA
1	OPEN

AC TEST SETUP



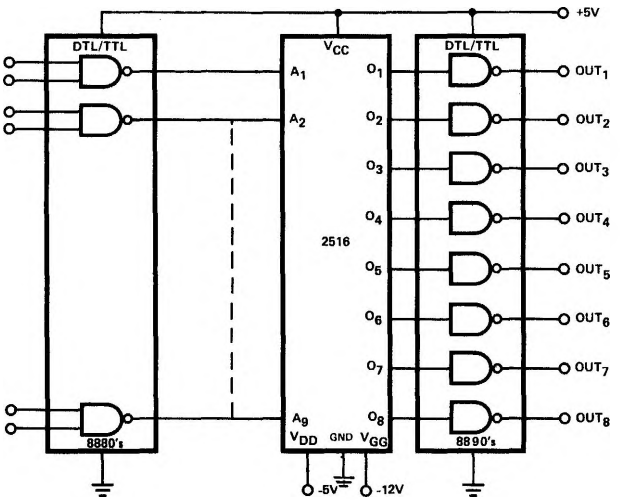
TIMING DIAGRAM (ADDRESS TIME)



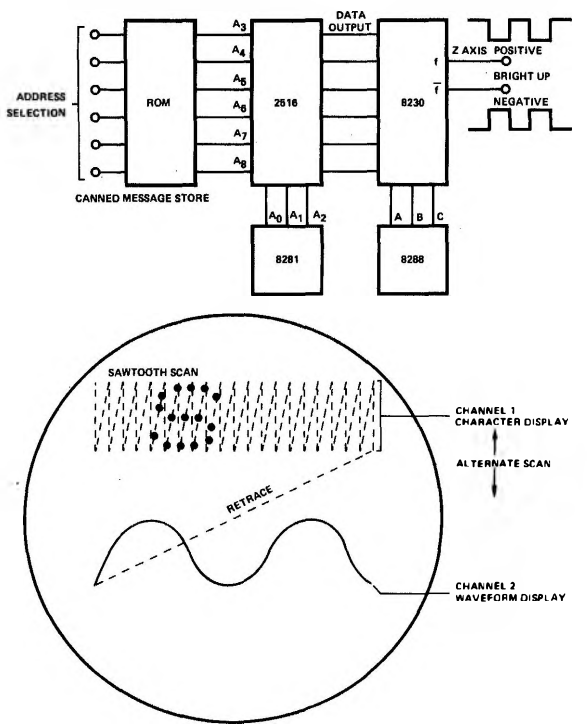
t_{CA}=CHARACTER ACCESS TIME
t_{CLA}=COLUMN ACCESS TIME

APPLICATIONS INFORMATION

DTL/TTL INTERFACING

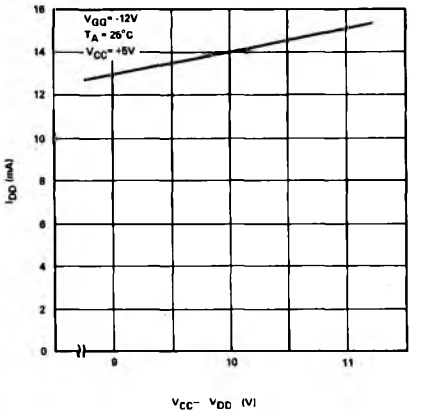


CRT DISPLAY MEMORY AND CHARACTER GENERATOR

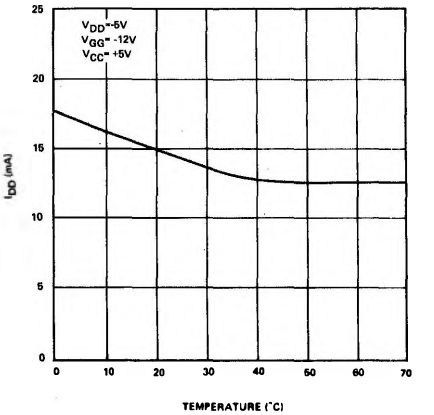


CHARACTERISTIC CURVES

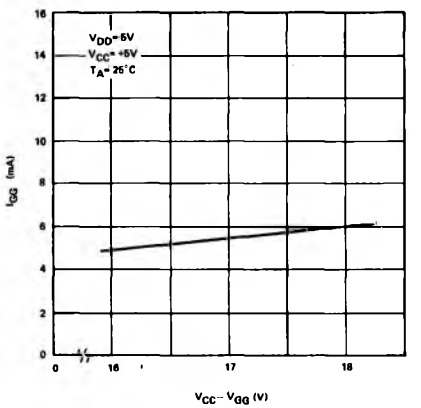
V_{DD} POWER SUPPLY CURRENT VERSUS VOLTAGE



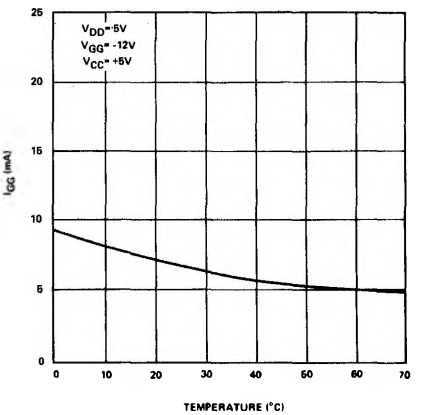
V_{DD} POWER SUPPLY CURRENT VERSUS TEMPERATURE



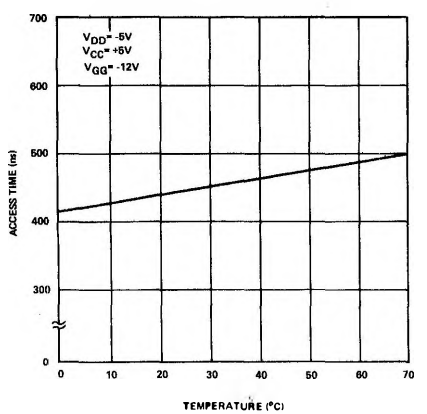
V_{GG} POWER SUPPLY CURRENT VERSUS VOLTAGE



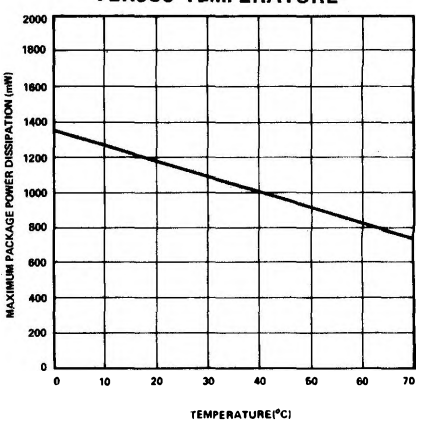
V_{GG} POWER SUPPLY CURRENT VERSUS TEMPERATURE



TYPICAL ACCESS TIME VERSUS TEMPERATURE

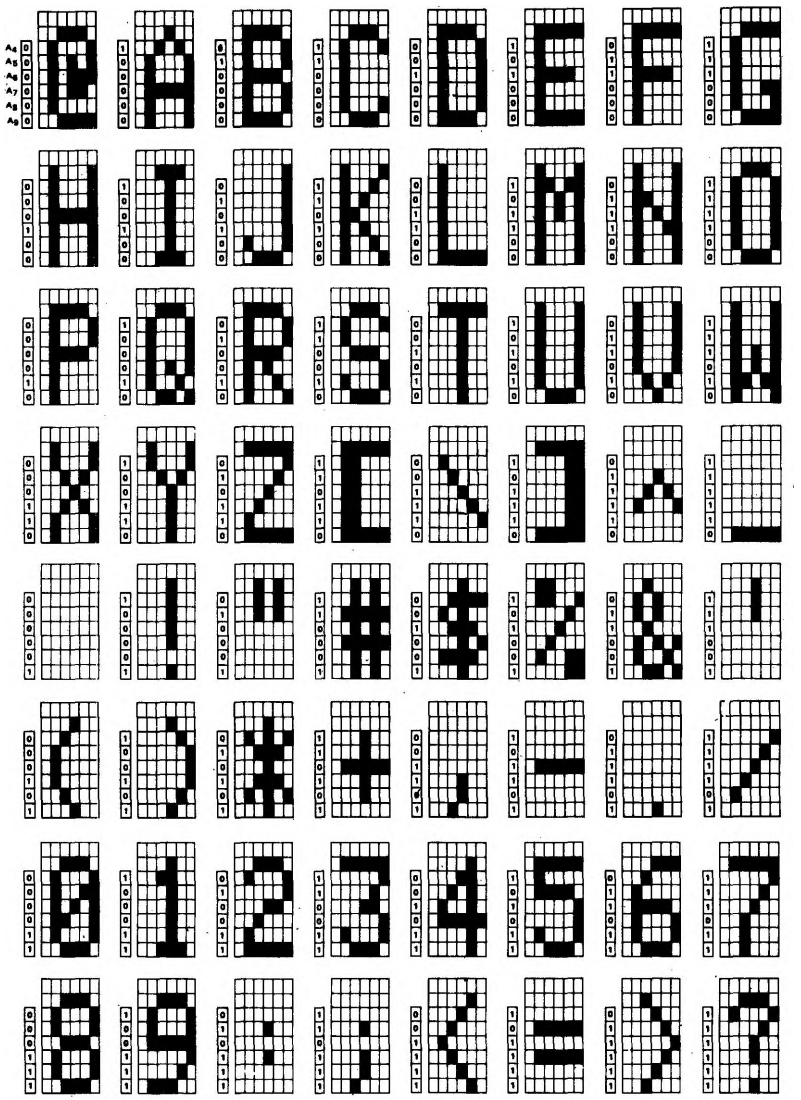


MAXIMUM PACKAGE POWER DISSIPATION VERSUS TEMPERATURE



ASCII CHARACTER FONT

2516NX/CM2150



NOTE: Forbidden addresses yield logic "1" outputs.

APPLICATIONS DATA:

OUTPUT INTERFACING NOTES

The tri-state outputs on this device exhibit three states:

"1" – low impedance to +5V
"0" – low impedance to -5V
OFF – high impedance = 10 megohm

The "off" state is controlled by the chip enable control inputs.

CUSTOM ROM ORGANIZATIONS

The 2516 is a static ROM with a total 64 x 6 x 8 bit capacity. This allows a standard 5 x 7 font to be encoded in the ROM, e.g., the 2516/CM2150 ASCII font standard product. Also custom coding of up to 6 x 8 character generators, also 256 x 8, 384 x 8, or 768 x 4 ROMs are available using Signetics "2516 Read Only Memory Software Package."

For applications requiring a 708 x 4 organization, CHIP ENABLE and CHIP ENABLE 2 are used to control outputs 1-4 and 5-8 respectively. The outputs are externally hard wired in pairs for this organization.

Custom versions of the 2516 can be supplied with a separate V_{DD} supply terminal for the output buffer. This feature permits operation at reduced power dissipation.