# onsemi

# 3-to-8 Line Decoder MC74VHCT138A

The MC74VHCT138A is an advanced high speed CMOS 3 to 8 decoder fabricated with silicon gate CMOS technology. It achieves high speed operation similar to equivalent Bipolar Schottky TTL while maintaining CMOS low power dissipation.

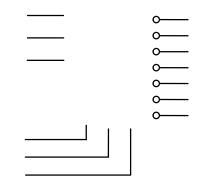
When the device is enabled, three Binary Select inputs (A0 A2) determine which one of the outputs ( $\overline{Y0}$   $\overline{Y7}$ ) will go Low. When enable input E3 is held Low or either E2 or E1 is held High, decoding function is inhibited and all outputs go high. E3, E2, and E1 inputs are provided to ease cascade connection and for use as an address decoder for memory systems.

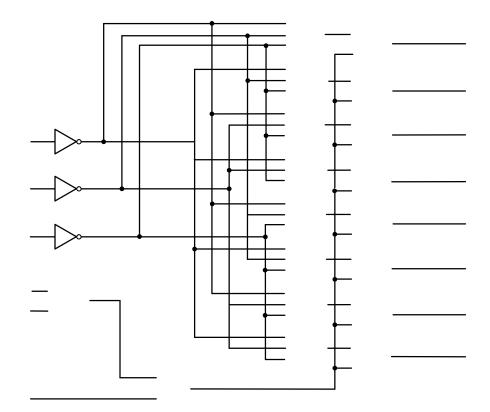
The VHCT inputs are compatible with TTL levels. This device can be used as a level converter for interfacing 3.3 V to 5.0 V, because they have full 5.0 V CMOS level output swings.

The VHCT138A input structures provide protection when voltages between 0 V and 5.5 V are applied, regardless of the supply voltage. The output structures also provide protection when  $V_{CC} = 0$  V. These input and output structures help prevent device destruction caused by supply voltage input/output voltage mismatch, battery backup, hot insertion, etc.

### Features

, andp008 033W(Features)Tj /TT3 1 Tf 12 0 0 13\* -. 12h3 1 u111c.s.13.3 V(Fe2r1ePiu10 mdD Tc 0 Tw (: I70.2992 406.0 al



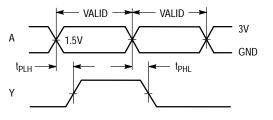


### MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V <sub>CC</sub>	DC Supply Voltage	– 0.5 to + 7.0	V
V <sub>in</sub>	DC Input Voltage	– 0.5 to + 7.0	V
V <sub>out</sub>	DC Output Voltage V <sub>CC</sub> = 0 High or Low State	- 0.5 to + 7.0 - 0.5 to V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input Diode Current	- 20	mA
I <sub>OK</sub>	Output Diode Current ( $V_{OUT} < GND; V_{OUT} > V_{CC}$ )	20	mA
l <sub>out</sub>	DC Output Current, per Pin	25	mA
I <sub>CC</sub>	DC Supply Current, V <sub>CC</sub> and GND Pins	75	mA
Р		-	-

25.852 refq59.754 593.348 38.268 -259 ref367 n0 792 2 -791.9846 Tc(În711336 8 73.4179C68 -259 r67 46.0913 592.2747 Tm0 g/T1 1 Tf.mA

# SWITCHING WAVEFORMS





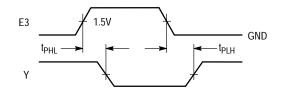
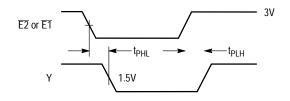


Figure 3.





\*Includes all probe and jig capacitance

Figure 5. Test Circuit



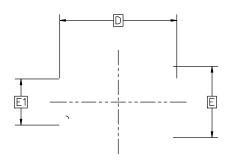
#### SOIC-16 9.90x3.90x1.37 1.27P CASE 751B ISSUE M

DATE 18 OCT 2024

- DIMENSIONS D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
  MAXIMUM MOLD PROTRUSION 0.1<sup>r</sup>

**b** DIMENSION AT MAXIMUM MATE

nm TOTAL IN EXCESS OF THE



<u>top view</u>

#### SOIC-16 9.90x3.90x1.37 1.27P CASE 751B ISSUE M

#### DATE 18 OCT 2024

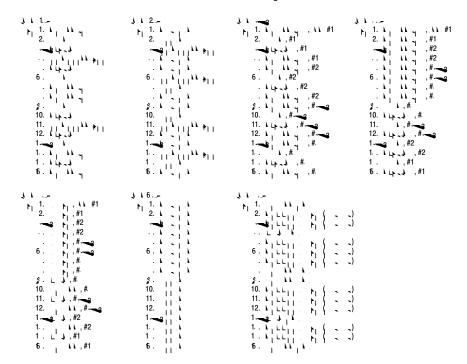
#### GENERIC MARKING DIAGRAM\*

16	A	H	A.	- A	- A	A	A	E
		XX)	XX)	XX	XX)	XX)	XX	G
		XX	XX)	XX)	XX)	XX	XX)	x
	0	D AWLYWW						
1	Ŧ	<u> </u>	Н	H	H	Н	H	Ъ

XXXXX = Specific Device Code

- A = Assembly Location
- WL = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb Free Package

\*This information is generic. Please refer to device data sheet for actual part marking. Pb Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.



DOCUMENT NUMBER:	98ASB42566B Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.			
DESCRIPTION:	SOIC-16 9.90X3.90X1.37 1	PAGE 2 OF 2		

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights of others.



SCALE 2:1

TSSOP-16 WB CASE 948F ISSUE B

DATE 19 OCT 2006

onsemi, , and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="http://www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. Onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or incruit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi