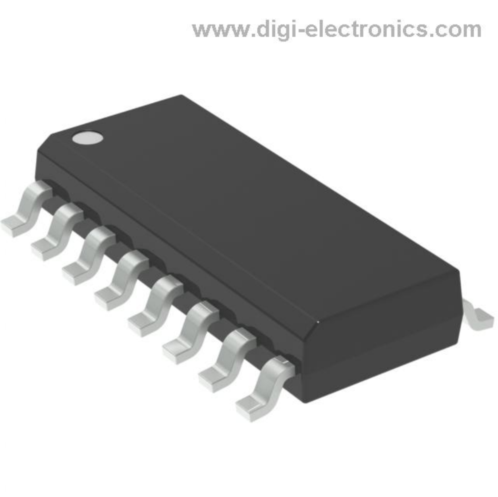
MC74VHC139DR2G Datasheet



https://www.DiGi-Electronics.com

DiGi Electronics Part Number	MC74VHC139DR2G-DG
Manufacturer	onsemi
Manufacturer Product Number	MC74VHC139DR2G
Description	IC DECODER/DEMUX 1X2:4 16SOIC
Detailed Description	Decoder/Demultiplexer 1 x 2:4 16-SOIC

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
MC74VHC139DR2G	onsemi
Series:	Product Status:
74VHC	Active
Type:	Circuit:
Decoder/Demultiplexer	1 x 2:4
Independent Circuits:	Current - Output High, Low:
2	8mA, 8mA
Voltage Supply Source:	Voltage - Supply:
Single Supply	2V ~ 5.5V
Operating Temperature:	Mounting Type:
-55°C ~ 125°C	Surface Mount
Package / Case:	Supplier Device Package:
16-SOIC (0.154", 3.90mm Width)	16-SOIC
Base Product Number:	
74VHC139	

Environmental & Export classification

RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8542.39.0001	

DATA SHEET
www.onsemi.com

Dual 2-to-4 Decoder/ Demultiplexer

MC74VHC139, MC74VHCT139A

The MC74VHC139/MC74VHCT139A is an advanced high speed CMOS 2−to−4 decoder/ demultiplexer 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 ($\overline{E}$ = low), it can be used for gating or as a data input for demultiplexing operations. When the enable input is held high, all four outputs are fixed high, independent of other inputs.

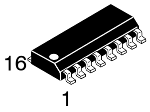
The MC74VHC139 inputs are compatible with standard CMOS levels while the MC74VHCT139A inputs are compatible with TTL levels. The MC74VHCT139A can be used as a level converter for interfacing 3.3 V to 5.0 V, because it has full 5.0 V CMOS level output swings.

The internal circuit is composed of three stages, including a buffer output which provides high noise immunity and stable output. The MC74VHC139 and MC74VHCT139A input structures tolerate voltages up to 5.5 V, allowing the interface of 5 V systems to 3 V systems.

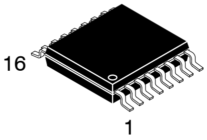
The MC74VHCT139A output structures provide protection when V_{CC} = 0 V. These output structures help prevent device destruction caused by supply voltage − input/output voltage mismatch, battery backup, hot insertion, etc.

Features

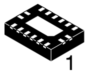
- High Speed: t_{PD} = 5 ns (Typ) at V_{CC} = 5.0 V
- Low Power Dissipation: I_{CC} = 4.0 μA (Max) at T_A = 25°C
- High Noise Immunity: $V_{NIH} = V_{NIL}$ = 28%
- Power Down Protection Provided
- Balanced Propagation Delays
- Designed for 2.0 V to 5.5 V (VHC)
  4.5 V to 5.5 V (VHCT)
- Low Noise: VOLP = 0.8 V (Max) (VHC)
- Pin and Function Compatible with Other Standard Logic Families
- Latchup Performance Exceeds 100 mA
- ESD Performance: Human Body Model > 2000 V
- Chip Complexity: 100 FETs or 25 Equivalent Gates
- −Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q100 Qualified and PPAP Capable
- These Devices are Pb−Free, Halogen Free/BFR Free and are RoHS−Compliant



SOIC−16
D SUFFIX
CASE 751B

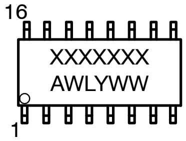


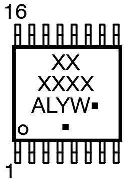
TSSOP−16
DT SUFFIX
CASE 948F

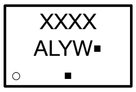


QFN16
MN SUFFIX
CASE 485AW

MARKING DIAGRAMS



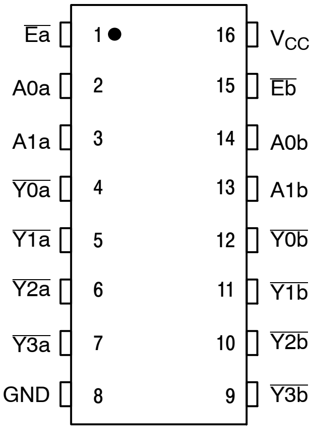




A = Assembly Location
WL, L = Wafer Lot
YY, Y = Year
WW, W = Work Week
G or ▪ = Pb−Free Package

(Note: Microdot may be in either location)

PIN ASSIGNMENTS



ORDERING INFORMATION

See detailed ordering and shipping information on page 7 of this data sheet.

June, 2024 − Rev. 5

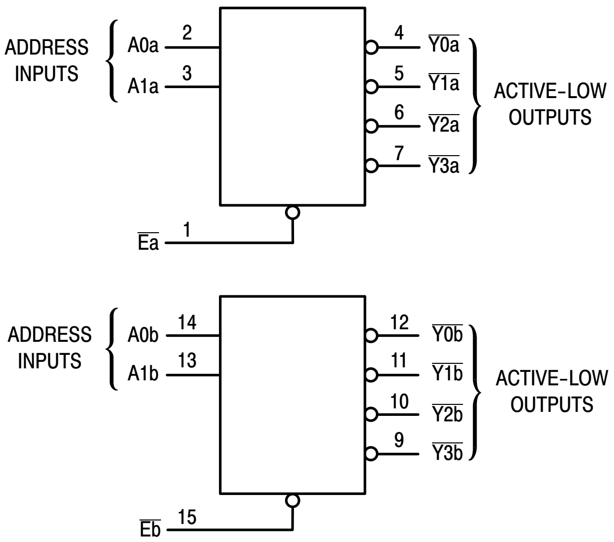


Figure 1. Logic Diagram

FUNCTION TABLE

Inputs			Outputs			
E	**A1**	**A0**	$\overline{Y0}$	$\overline{Y1}$	$\overline{Y2}$	$\overline{Y3}$
H	X	X	H	H	H	H
L	L	L	L	H	H	H
L	L	H	H	L	H	H
L	H	L	H	H	L	H
L	H	H	H	H	H	L

MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{CC}	DC Supply Voltage	–0.5 to +6.5	V
V_{IN}	DC Input Voltage	–0.5 to +6.5	V
V_{OUT}	DC Output Voltage (MC74VHC)	–0.5 to V_{CC} + 0.5	V
	DC Output Voltage (MC74VHCT) Active Mode (High or Low State) Tristate Mode (Note 1) Power–Off Mode (V_{CC} = 0 V)	–0.5 to V_{CC} + 0.5 –0.5 to +6.5 –0.5 to +6.5	
I_{IN}	DC Input Current, per Pin	±20	mA
I_{OUT}	DC Output Current, per Pin	±25	mA
I_{CC}	DC Supply Current, V_{CC} and GND Pins	±75	mA
I_{IK}	Input Clamp Current	–20	mA
I_{OK}	Output Clamp Current MC74VHC MC74VHCT	±20 –20	mA
T_{STG}	Storage Temperature Range	–65 to +150	°C
T_L	Lead Temperature, 1 mm from Case for 10 secs	260	°C
T_J	Junction Temperature Under Bias	+150	°C
θ_{JA}	Thermal Resistance (Note 2) SOIC–16 QFN16 TSSOP–16	126 118 159	°C/W
P_D	Power Dissipation in Still Air at 25°C SOIC–16 QFN16 TSSOP–16	995 1062 787	mW
MSL	Moisture Sensitivity	Level 1	–
F_R	Flammability Rating Oxygen Index: 28 to 34	UL 94 V–0 @ 0.139 in	–
V_{ESD}	ESD Withstand Voltage (Note 3) Human Body Model Charged Device Model	>2000 N/A	V
$I_{LATCHUP}$	Latchup Performance (Note 4)	±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Applicable to devices with outputs that may be tri–stated.
2. Measured with minimum pad spacing on an FR4 board, using 76 mm–by–114 mm, 2–ounce copper trace no air flow per JESD51–7.
3. HBM tested to EIA / JESD22–A114–A. CDM tested to JESD22–C101–A. JEDEC recommends that ESD qualification to EIA/JESD22–A115A (Machine Model) be discontinued.
4. Tested to EIA/JESD78 Class II.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Max	Unit
MC74VHC					
V_{CC}	DC Supply Voltage		2.0	5.5	V
V_{IN}	DC Input Voltage (Note 5)		0	5.5	V
V_{OUT}	DC Output Voltage (Note 5)		0	V_{CC}	V
T_A	Operating Temperature		−55	+125	°C
t_r, t_f	Input Rise or Fall Rate	V_{CC} = 3.0 V to 3.6 V V_{CC} = 4.5 V to 5.5 V	0 0	100 20	ns/V
MC74VHCT					
V_{CC}	DC Supply Voltage		2.0	5.5	V
V_{IN}	DC Input Voltage (Note 5)		0	5.5	V
V_{OUT}	DC Output Voltage (Note 5)	Active Mode (High or Low State) Tristate Mode Power−Off Mode (V_{CC} = 0 V)	0 0 0	V_{CC} 5.5 5.5	V
T_A	Operating Temperature		−55	+125	°C
t_r, t_f	Input Rise or Fall Rate	V_{CC} = 4.5 V to 5.5 V	0	20	ns/V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

5. Unused inputs must always be tied to an appropriate logic voltage level (e.g., either GND or V_{CC}). Unused outputs must be left open.

DC ELECTRICAL CHARACTERISTICS (MC74VHC139)

Symbol	Parameter	Test Conditions	V_{CC} (V)	T_A = 25°C			T_A = ≤ 85°C		T_A = ≤ 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{IH}	Minimum High−Level Input Voltage		2.0 3.0 4.5 5.5	1.5 2.1 3.15 3.85			1.5 2.1 3.15 3.85		1.5 2.1 3.15 3.85		V
V_{IL}	Maximum Low−Level Input Voltage		2.0 3.0 4.5 5.5			0.5 0.9 1.35 1.65		0.5 0.9 1.35 1.65		0.5 0.9 1.35 1.65	V
V_{OH}	Minimum High−Level Output Voltage V_{IN} = V_{IH} or V_{IL}	V_{IN} = V_{IH} or V_{IL} I_{OH} = − 50 μA	2.0 3.0 4.5	1.9 2.9 4.4	2.0 3.0 4.5		1.9 2.9 4.4		1.9 2.9 4.4		V
		V_{IN} = V_{IH} or V_{IL} I_{OH} = −4 mA I_{OH} = −8 mA	3.0 4.5	2.58 3.94			2.48 3.80		2.34 3.66		
V_{OL}	Maximum Low−Level Output Voltage V_{IN} = V_{IH} or V_{IL}	V_{IN} = V_{IH} or V_{IL} I_{OL} = 50 μA	2.0 3.0 4.5		0.0 0.0 0.0	0.1 0.1 0.1		0.1 0.1 0.1		0.1 0.1 0.1	V
		V_{IN} = V_{IH} or V_{IL} I_{OL} = 4 mA I_{OL} = 8 mA	3.0 4.5			0.36 0.36		0.44 0.44		0.52 0.52	
I_{IN}	Maximum Input Leakage Current	V_{IN} = 5.5 V or GND	0 to 5.5			± 0.1		± 1.0		± 1.0	μA
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5			4.0		40.0		40.0	μA

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

AC ELECTRICAL CHARACTERISTICS (MC74VHC139)

Symbol	Parameter	Test Conditions	T_A = 25°C			T_A = − 40 to 85°C		T_A = − 55 to 125°C		Unit
			Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, A to Y	V_{CC} = 3.3 ± 0.3 V C_L = 15 pF C_L = 50 pF		7.2 9.7	11.0 14.5	1.0 1.0	13.0 16.5	1.0 1.0	13.0 16.5	ns
		V_{CC} = 5.0 ± 0.5 V C_L = 15 pF C_L = 50 pF		5.0 6.5	7.2 9.2	1.0 1.0	8.5 10.5	1.0 1.0	8.5 10.5	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, $\overline{E}$ to Y	V_{CC} = 3.3 ± 0.3 V C_L = 15 pF C_L = 50 pF		6.4 8.9	9.2 12.7	1.0 1.0	11.0 14.5	1.0 1.0	11.0 14.5	ns
		V_{CC} = 5.0 ± 0.5 V C_L = 15 pF C_L = 50 pF		4.4 5.9	6.3 8.3	1.0 1.0	7.5 9.5	1.0 1.0	7.5 9.5	
C_{IN}	Maximum Input Capacitance			4	10		10		10	pF

		Typical @ 25°C, V_{CC} = 5.0 V	
C_{PD}	Power Dissipation Capacitance (Note 1)	26	pF

1. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $I_{CC(OPR)} = C_{PD} \bullet V_{CC} \bullet f_{in} + I_{CC}/2$ (per decoder). C_{PD} is used to determine the no−load dynamic power consumption; $P_D = C_{PD} \bullet V_{CC}{}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$.

DC CHARACTERISTICS (MC74VHCT139A)

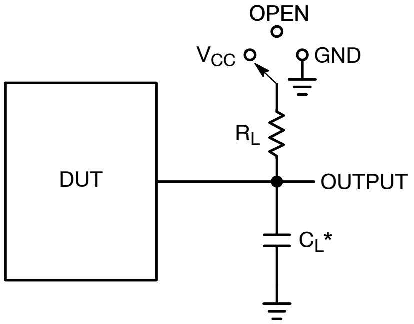
Symbol	Parameter	Condition	V_{CC} (V)	T_A = 25°C			T_A ≤ 85°C		T_A = – 55 to 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
V_{IH}	Minimum High–Level Input Voltage		4.5 to 5.5	2			2		2		V
V_{IL}	Maximum Low–Level Input Voltage		4.5 to 5.5			0.8		0.8		0.8	V
V_{OH}	Maximum High–Level Output Voltage	V_{IN} = V_{IH} or V_{IL} I_{OH} = –50 µA	4.5	4.4	4.5		4.4		4.4		V
		V_{IN} = V_{IH} or V_{IL} I_{OH} = –8 mA	4.5	3.94			3.8		3.66		
V_{OL}	Maximum Low–Level Output Voltage	V_{IN} = V_{IH} or V_{IL} I_{OL} = 50 µA	4.5		0	0.1		0.1		0.1	V
		V_{IN} = V_{IH} or V_{IL} I_{OH} = 8 mA	4.5			0.36		0.44		0.52	
I_{IN}	Input Leakage Current	V_{IN} = 5.5 V or GND	0 to 5.5			±0.1		±1.0		±1.0	µA
I_{CC}	Maximum Quiescent Supply Current	V_{IN} = V_{CC} or GND	5.5			4.0		40.0		40.0	µA
I_{CCT}	Additional Quiescent Supply Current (per Pin)	Any one input: V_{IN} = 3.4 V All other inputs: V_{IN} = V_{CC} or GND	5.5			1.35		1.5		1.5	µA
I_{OPD}	Output Leakage Current	V_{OUT} = 5.5 V	0			0.5		5		5	µA

AC ELECTRICAL CHARACTERISTICS (MC74VHCT139A)

Symbol	Parameter	Test Conditions		T_A = 25°C			T_A ≤ 85°C		T_A = – 55 to 125°C		Unit
				Min	Typ	Max	Min	Max	Min	Max	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, A to Y	V_{CC} = 3.3 ± 0.3 V	C_L = 15 pF		7.2	11.0	1.0	13.0	1.0	13.0	ns
			C_L = 50 pF		9.7	14.5	1.0	16.5	1.0	16.5	
		V_{CC} = 5.0 ± 0.5 V	C_L = 15 pF		5.0	7.2	1.0	8.5	1.0	8.5	
			C_L = 50 pF		6.5	9.2	1.0	10.5	1.0	10.5	
t_{PLH}, t_{PHL}	Maximum Propagation Delay, $\overline{E}$ to Y	V_{CC} = 3.3 ± 0.3 V	C_L = 15 pF		6.4	9.2	1.0	11.0	1.0	11.0	ns
			C_L = 50 pF		8.9	12.7	1.0	14.5	1.0	14.5	
		V_{CC} = 5.0 ± 0.5 V	C_L = 15 pF		4.4	6.3	1.0	7.5	1.0	7.5	
			C_L = 50 pF		5.9	8.3	1.0	9.5	1.0	9.5	
C_{IN}	Maximum Input Capacitance				4	10		10		10	pF

		Typical @ 25°C, V_{CC} = 5.0V	
C_{PD}	Power Dissipation Capacitance (Note 2)	26	pF

2. C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load. Average operating current can be obtained by the equation: $I_{CC(OPR)} = C_{PD} \bullet V_{CC} \bullet f_{in} + I_{CC}/2$ (per decoder). C_{PD} is used to determine the no–load dynamic power consumption; $P_D = C_{PD} \bullet V_{CC}^2 \bullet f_{in} + I_{CC} \bullet V_{CC}$.



*C_L Includes probe and jig capacitance

Test	Switch Position	C_L	R_L
t_{PLH} / t_{PHL}	Open	See AC Characteristics Table	1 kΩ
t_{PLZ} / t_{PZL}	V_{CC}		
t_{PHZ} / t_{PZH}	GND		

Figure 2. Test Circuit

SWITCHING WAVEFORMS

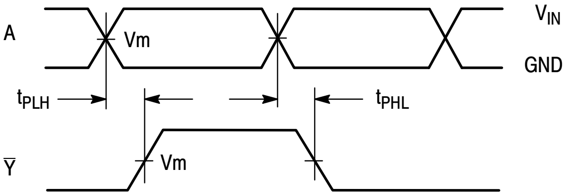


Figure 3.

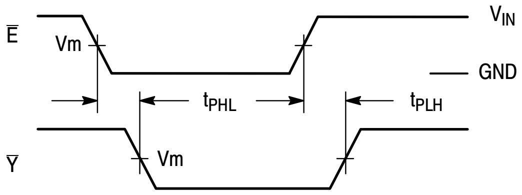


Figure 4.

Device	VIN, V	Vm, V
MC74VHC139	V_{CC}	50% x V_{CC}
MC74VHCT139A	3 V	1.5 V

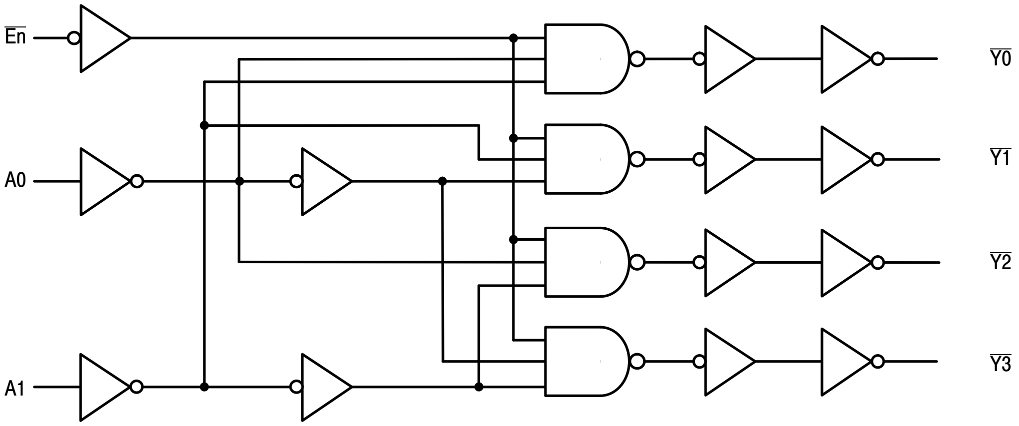


Figure 5. Expanded Logic Diagram
(1/2 of Device)

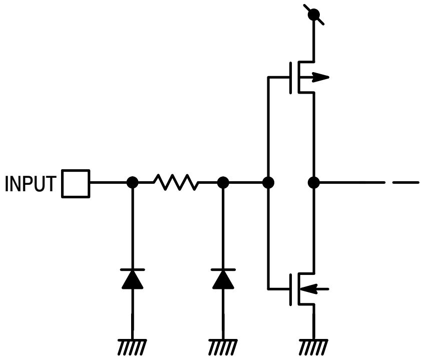


Figure 6. Input Equivalent Circuit

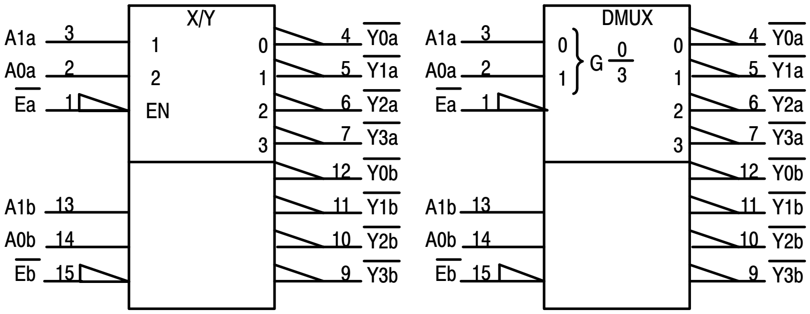


Figure 7. IEC Logic Diagram

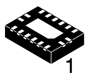
ORDERING INFORMATION

Device	Marking	Package	Shipping†
MC74VHC139DR2G	VHC139G	SOIC−16	2500 / Tape & Reel
MC74VHC139DR2G−Q*	VHC139G	SOIC−16	2500 / Tape & Reel
MC74VHC139DTR2G	VHC 139	TSSOP−16	2500 / Tape & Reel
MC74VHC139DTR2G−Q*	VHC 139	TSSOP−16	2500 / Tape & Reel
MC74VHCT139ADR2G	VHCT139AG	SOIC−16	2500 / Tape & Reel
MC74VHCT139ADTR2G	VHCT 139A	TSSOP−16	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*−Q Suffix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC−Q100 Qualified and PPAP Capable.

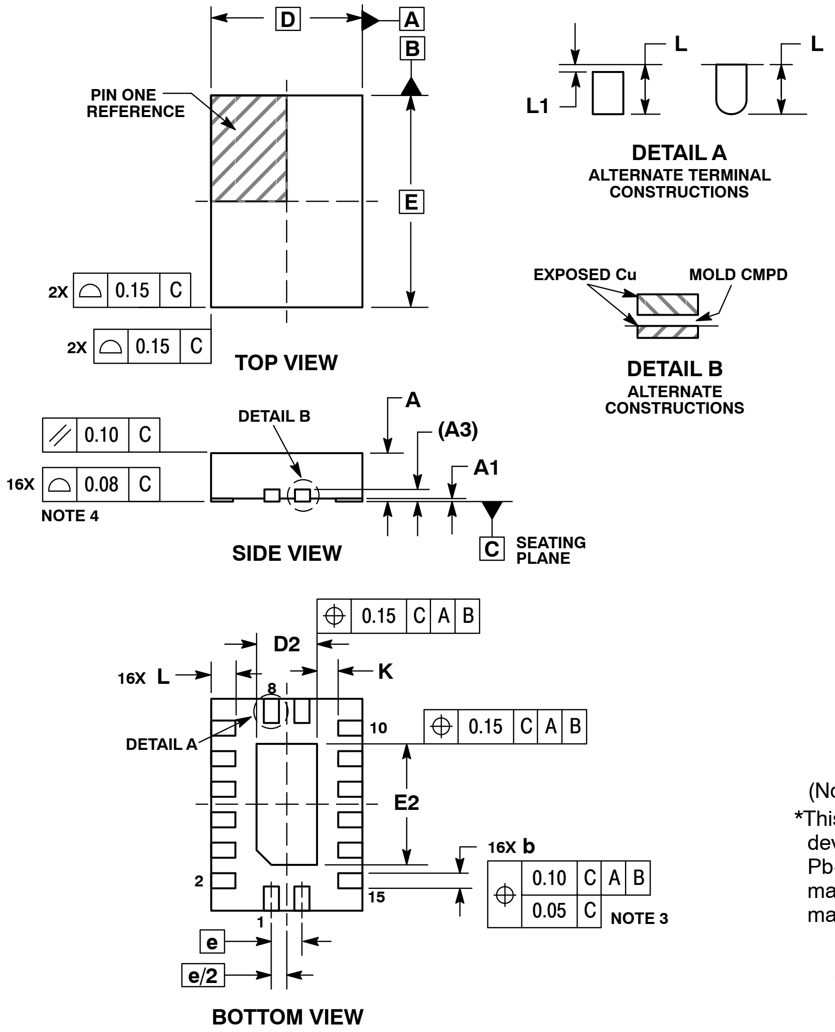
PACKAGE DIMENSIONS



SCALE 2:1

QFN16, 2.5x3.5, 0.5P
CASE 485AW
ISSUE O

DATE 11 DEC 2008



NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. DIMENSIONS b APPLIES TO PLATED TERMINAL AND IS MEASURED BETWEEN 0.15 AND 0.30 MM FROM TERMINAL.
4. COPLANARITY APPLIES TO THE EXPOSED PAD AS WELL AS THE TERMINALS.

	MILLIMETERS	
DIM	MIN	MAX
A	0.80	1.00
A1	0.00	0.05
A3	0.20 REF	
b	0.20	0.30
D	2.50 BSC	
D2	0.85	1.15
E	3.50 BSC	
E2	1.85	2.15
e	0.50 BSC	
K	0.20	---
L	0.35	0.45
L1	---	0.15

GENERIC MARKING DIAGRAM*

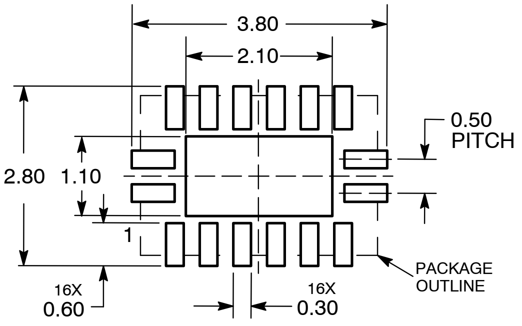
XXXX
ALYW▪
○ ▪

XXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb−Free Package

(Note: Microdot may be in either location)

*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.

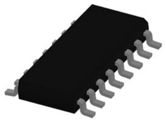
RECOMMENDED SOLDERING FOOTPRINT*



DIMENSIONS: MILLIMETERS

*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

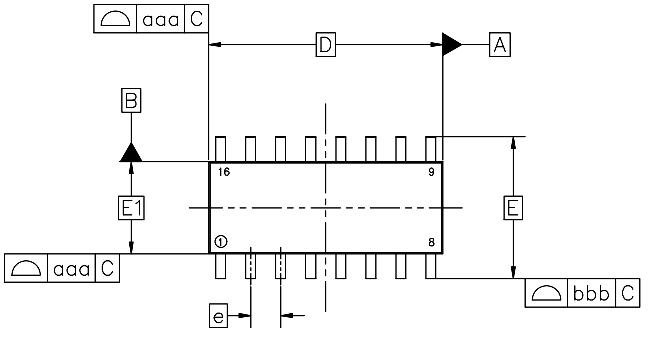


SOIC−16 9.90x3.90x1.37 1.27P
CASE 751B
ISSUE M

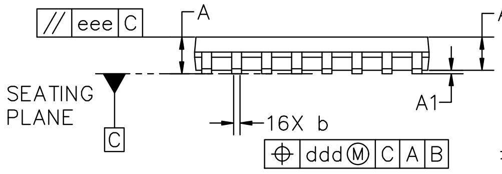
DATE 18 OCT 2024

NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2018.
2. DIMENSION IN MILLIMETERS. ANGLE IN DEGREES.
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15mm PER SIDE.
5. DIMENSION b DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127mm TOTAL IN EXCESS OF THE b DIMENSION AT MAXIMUM MATERIAL CONDITION.

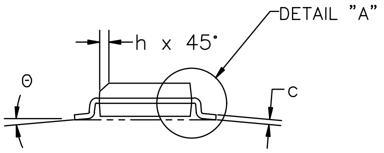
	MILLIMETERS		
DIM	MIN	NOM	MAX
A	1.35	1.55	1.75
A1	0.10	0.18	0.25
A2	1.25	1.37	1.50
b	0.35	0.42	0.49
c	0.19	0.22	0.25
D	9.90 BSC		
E	6.00 BSC		
E1	3.90 BSC		
e	1.27 BSC		
h	0.25	−−−	0.50
L	0.40	0.83	1.25
L1	1.05 REF		
Θ	0°	−−−	7°
TOLERANCE OF FORM AND POSITION			
aaa	0.10		
bbb	0.20		
ccc	0.10		
ddd	0.25		
eee	0.10		



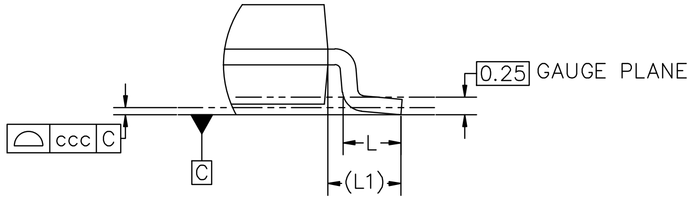
TOP VIEW



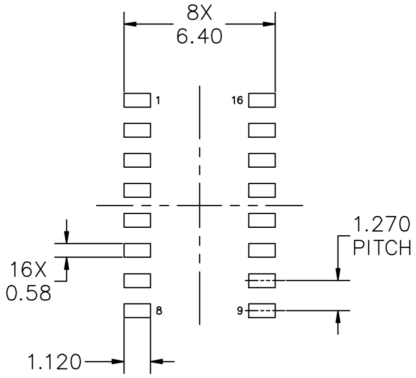
SIDE VIEW



END VIEW



DETAIL "A"
Scale 3:1



RECOMMENDED MOUNTING FOOTPRINT

*FOR ADDITIONAL INFORMATION ON OUR PB−FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE onsemi SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERRM/D

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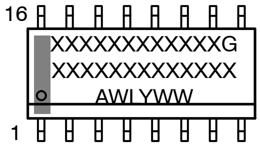
DESCRIPTION:	**SOIC−16 9.90X3.90X1.37 1.27P**	**PAGE 1 OF 2**

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

DATE 18 OCT 2024

GENERIC MARKING DIAGRAM*



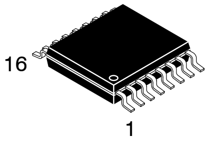
XXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb−Free Package

*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.

	STYLE 1:	STYLE 2:	STYLE 3:	STYLE 4:
PIN 1.	COLLECTOR	CATHODE	COLLECTOR, DYE #1	COLLECTOR, DYE #1
2.	BASE	ANODE	BASE, #1	COLLECTOR, #1
3.	EMITTER	NO CONNECTION	EMITTER, #1	COLLECTOR, #2
4.	NO CONNECTION	CATHODE	COLLECTOR, #1	COLLECTOR, #2
5.	EMITTER	CATHODE	COLLECTOR, #2	COLLECTOR, #3
6.	BASE	NO CONNECTION	BASE, #2	COLLECTOR, #3
7.	COLLECTOR	ANODE	EMITTER, #2	COLLECTOR, #4
8.	COLLECTOR	CATHODE	COLLECTOR, #2	COLLECTOR, #4
9.	BASE	CATHODE	COLLECTOR, #3	BASE, #4
10.	EMITTER	ANODE	BASE, #3	EMITTER, #4
11.	NO CONNECTION	NO CONNECTION	EMITTER, #3	BASE, #3
12.	EMITTER	CATHODE	COLLECTOR, #3	EMITTER, #3
13.	BASE	CATHODE	COLLECTOR, #4	BASE, #2
14.	COLLECTOR	NO CONNECTION	BASE, #4	EMITTER, #2
15.	EMITTER	ANODE	EMITTER, #4	BASE, #1
16.	COLLECTOR	CATHODE	COLLECTOR, #4	EMITTER, #1

	STYLE 5:	STYLE 6:	STYLE 7:
PIN 1.	DRAIN, DYE #1	CATHODE	SOURCE N-CH
2.	DRAIN, #1	CATHODE	COMMON DRAIN (OUTPUT)
3.	DRAIN, #2	CATHODE	COMMON DRAIN (OUTPUT)
4.	DRAIN, #2	CATHODE	GATE P-CH
5.	DRAIN, #3	CATHODE	COMMON DRAIN (OUTPUT)
6.	DRAIN, #3	CATHODE	COMMON DRAIN (OUTPUT)
7.	DRAIN, #4	CATHODE	COMMON DRAIN (OUTPUT)
8.	DRAIN, #4	CATHODE	SOURCE P-CH
9.	GATE, #4	ANODE	SOURCE P-CH
10.	SOURCE, #4	ANODE	COMMON DRAIN (OUTPUT)
11.	GATE, #3	ANODE	COMMON DRAIN (OUTPUT)
12.	SOURCE, #3	ANODE	COMMON DRAIN (OUTPUT)
13.	GATE, #2	ANODE	GATE N-CH
14.	SOURCE, #2	ANODE	COMMON DRAIN (OUTPUT)
15.	GATE, #1	ANODE	COMMON DRAIN (OUTPUT)
16.	SOURCE, #1	ANODE	SOURCE N-CH

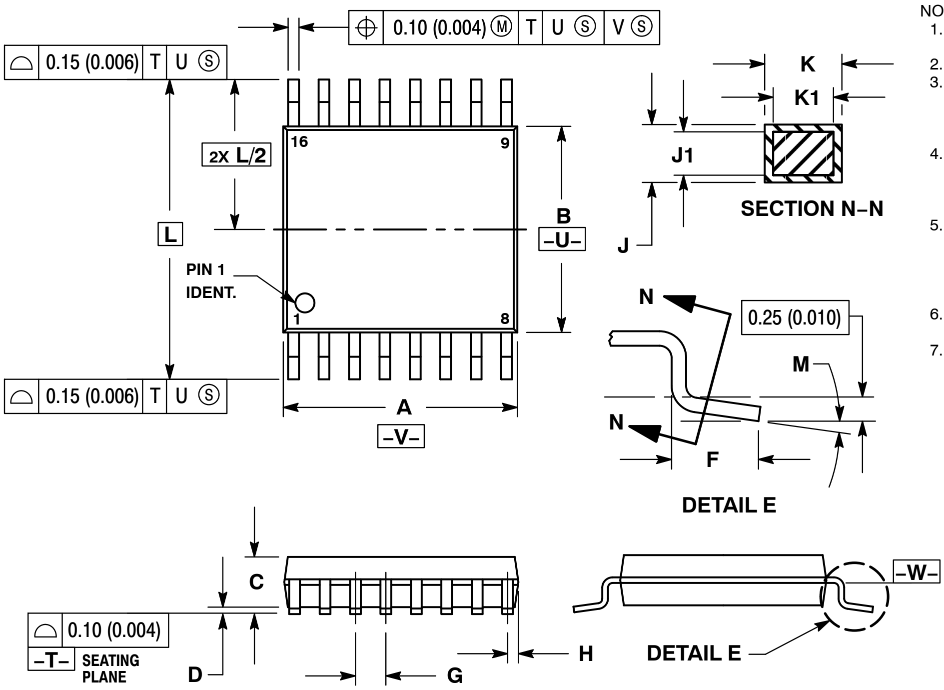
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS



SCALE 2:1

TSSOP−16 WB
CASE 948F
ISSUE B

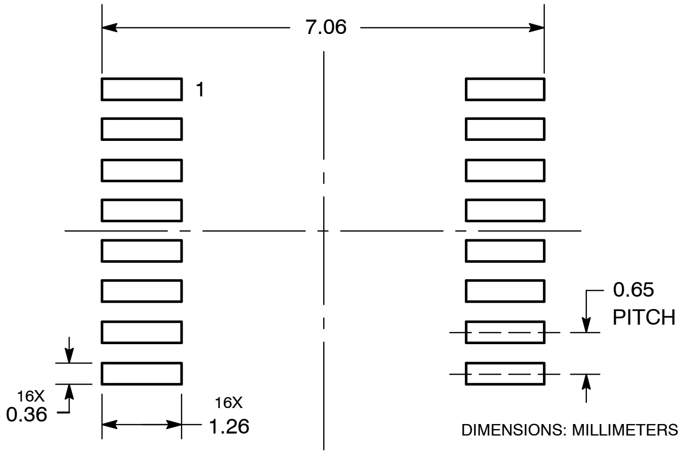
DATE 19 OCT 2006



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. DIMENSION K DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE K DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
7. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE −W−.

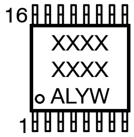
	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	4.90	5.10	0.193	0.200
B	4.30	4.50	0.169	0.177
C	−−−	1.20	−−−	0.047
D	0.05	0.15	0.002	0.006
F	0.50	0.75	0.020	0.030
G	0.65 BSC		0.026 BSC	
H	0.18	0.28	0.007	0.011
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC		0.252 BSC	
M	0 °	8 °	0 °	8 °

RECOMMENDED SOLDERING FOOTPRINT*



*For additional information on our Pb−Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
G or ▪ = 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.

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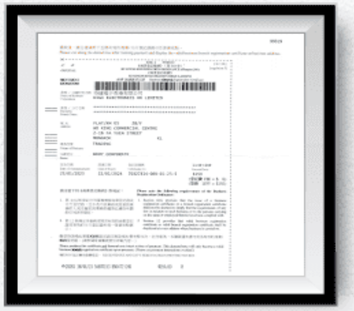

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