

Figure 1. Pinout: 16–Lead Plastic Package (Top View)

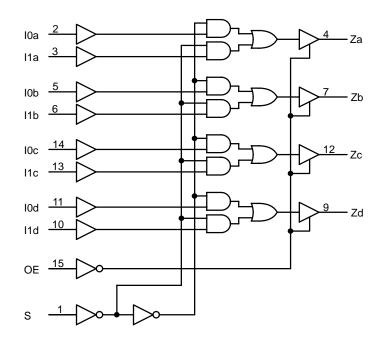


Figure 2. Logic Diagram

PIN NAMES

Pins	Function			
l0n	Source 0 Data Inputs			
l1n	Source 1 Data Inputs			
ŌĒ	Output Enable Input			
S	Select Input			
Zn	Outputs			

TRUTH TABLE

	Inp	Outputs		
ŌĒ	S	l0n	l1n	Zn
Н	Х	Х	Х	Z
L	Н	Х	L	L
L	Н	Х	н	н
L	L	L	х	L
L	L	Н	Х	Н

H = High Voltage Level

L = Low Voltage Level

X = High or Low Voltage Level and Transitions are Acceptable
 Z = High Impedance State

For ICC reasons, DO NOT FLOAT Inputs

MAXIMUM RATINGS

Symbol	Parameter	Value	Condition	Unit
V _{CC}	DC Supply Voltage	-0.5 to +7.0		V
VI	DC Input Voltage	$-0.5 \le V_I \le +7.0$		V
Vo	DC Output Voltage	$-0.5 \le V_I \le +7.0$	Output in 3-State	V
		$-0.5 \leq V_O \leq V_{CC} + 0.5$	Output in HIGH or LOW State (Note 1)	V
I _{IK}	DC Input Diode Current	-50	V _I < GND	mA
I _{ОК}	DC Output Diode Current	-50	V _O < GND	mA
		+50	V _O > V _{CC}	mA
lo	DC Output Source/Sink Current	±50		mA
I _{CC}	DC Supply Current Per Supply Pin	±100		mA
I _{GND}	DC Ground Current Per Ground Pin	±100		mA
T _{STG}	Storage Temperature Range	-65 to +150		°C

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected. 1. I_O absolute maximum rating must be observed.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parame	ter	Min	Туре	Max	Unit
V _{CC}	Supply Voltage	Operating Data Retention Only	2.0 1.5	2.5, 3.3 2.5, 3.3	3.6 3.6	V
VI	Input Voltage		0		5.5	V
V _O	Output Voltage	(HIGH or LOW State) (3–State)	0 0		V _{CC} 5.5	V
I _{OH}	HIGH Level Output Current	$V_{CC} = 3.0 V - 3.6 V$ $V_{CC} = 2.7 V - 3.0 V$ $V_{CC} = 2.3 V - 2.7 V$			-24 -12 -8	mA
I _{OL}	LOW Level Output Current	$V_{CC} = 3.0 V - 3.6 V$ $V_{CC} = 2.7 V - 3.0 V$ $V_{CC} = 2.3 V - 2.7 V$			+24 +12 +8	mA
T _A	Operating Free–Air Temperature		-40		+85	°C
$\Delta t/\Delta V$	Input Transition Rise or Fall Rate, V_{IN} V_{CC} = 3.0 V	from 0.8 V to 2.0 V,	0		10	ns/V

ORDERING INFORMATION

Device	Package	Shipping [†]
MC74LCX257DR2	SOIC-16	2500 Tape & Reel
MC74LCX257DR2G	SOIC-16 (Pb-Free)	2500 Tape & Reel
MC74LCX257DT	TSSOP-16*	96 Units / Rail
MC74LCX257DTR2	TSSOP-16*	2500 Tape & Reel
MC74LCX257M	SOEIAJ-16	48 Units / Rail
MC74LCX257MEL	SOEIAJ-16	2000 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.
 *This package is inherently Pb–Free.

DC ELECTRICAL CHARACTERISTICS

			T _A = −40°C		
Symbol	Characteristic	Condition	Min	Max	Unit
V _{IH}	HIGH Level Input Voltage (Note 2)	$2.3 \text{ V} \leq \text{V}_{CC} \leq 2.7 \text{ V}$	1.7		V
		$2.7 \text{ V} \le \text{V}_{\text{CC}} \le 3.6 \text{ V}$	2.0		
V _{IL}	LOW Level Input Voltage (Note 2)	$2.3 \text{ V} \le \text{V}_{\text{CC}} \le 2.7 \text{ V}$		0.7	V
		$2.7 \text{ V} \le \text{V}_{\text{CC}} \le 3.6 \text{ V}$		0.8	
V _{OH}	HIGH Level Output Voltage	$2.3 \text{ V} \leq \text{V}_{CC} \leq 3.6 \text{ V}; \text{ I}_{OH} = -100 \mu\text{A}$	V _{CC} – 0.2		V
		V _{CC} = 2.3 V; I _{OH} = -8 mA	1.8		
		V _{CC} = 2.7 V; I _{OH} = -12 mA	2.2		
		V _{CC} = 3.0 V; I _{OH} = -18 mA	2.4		
		V _{CC} = 3.0 V; I _{OH} = -24 mA	2.2		
V _{OL} LOW Level Output Voltage	LOW Level Output Voltage	$2.3 \text{ V} \leq \text{V}_{CC} \leq 3.6 \text{ V}; \text{ I}_{OL} = 100 \mu\text{A}$		0.2	V
		V _{CC} = 2.3 V; I _{OL} = 8 mA		0.6	
		V _{CC} = 2.7 V; I _{OL} = 12 mA		0.4	
		V _{CC} = 3.0 V; I _{OL} = 16 mA		0.4	
		V _{CC} = 3.0 V; I _{OL} = 24 mA		0.55	
l _l	Input Leakage Current	$2.3 \text{ V} \leq \text{V}_{CC} \leq 3.6 \text{ V}; 0 \text{ V} \leq \text{V}_{I} \leq 5.5 \text{ V}$		±5	μΑ
I _{OZ}	3-State Output Current	$2.3 \le V_{CC} \le 3.6 \text{ V}; 0 \text{ V} \le V_O \le 5.5 \text{ V};$ $V_I = V_{IH} \text{ or } V_{IL}$		±5	μΑ
I _{OFF}	Power–Off Leakage Current	$V_{CC} = 0 \text{ V}; \text{ V}_{I} \text{ or } \text{ V}_{O} = 5.5 \text{ V}$		10	μΑ
I _{CC}	Quiescent Supply Current	$2.3 \leq V_{CC} \leq 3.6$ V; V_I = GND or V_{CC}		10	μΑ
		$2.3 \leq V_{CC} \leq 3.6 \text{ V}; \ 3.6 \leq V_{I} \text{ or } V_{O} \leq 5.5 \text{ V}$		±10	1
ΔI_{CC}	Increase in I _{CC} per Input	$2.3 \le V_{CC} \le 3.6 \text{ V}; \text{ V}_{IH} = V_{CC} - 0.6 \text{ V}$		500	μA

2. These values of V_I are used to test DC electrical characteristics only.

AC CHARACTERISTICS t_R = t_F = 2.5 ns; R_L = 500 Ω

			Limits						
				T _A = −40°C to +85°C					
			V _{CC} = 3.3	$V \pm 0.3 V$	V _{CC} =	2.7 V	V _{CC} = 2.5	V \pm 0.2 V	
			C _L =	50 pF	C _L =	50 pF	C _L =	30 pF	
Symbol	Parameter	Waveform	Min	Max	Min	Max	Min	Max	Unit
t _{PLH}	Propagation Delay	1	1.5	6.0	1.5	6.5	1.5	7.2	ns
t _{PHL}	In to Zn		1.5	6.0	1.5	6.5	1.5	7.2	
t _{PLH}	Propagation Delay	1, 2	1.5	7.0	1.5	8.5	1.5	9.1	ns
t _{PHL}	S to Zn		1.5	7.0	1.5	8.5	1.5	9.1	
t _{PZH}	Output Enable Time to	3	1.5	7.0	1.5	8.5	1.5	9.1	ns
t _{PZL}	High and Low Level		1.5	7.0	1.5	8.5	1.5	9.1	
t _{PHZ}	Output Disable Time From	3	1.5	5.5	1.5	6.0	1.5	6.6	ns
t _{PLZ}	High and Low Level		1.5	5.5	1.5	6.0	1.5	6.6	
tOSHL	Output-to-Output Skew			1.0					ns
tOSLH	(Note 3)			1.0					

 Skew is defined as the absolute value of the difference between the actual propagation delay for any two separate outputs of the same device. The specification applies to any outputs switching in the same direction, either HIGH-to-LOW (t_{OSHL}) or LOW-to-HIGH (t_{OSLH}); parameter guaranteed by design.

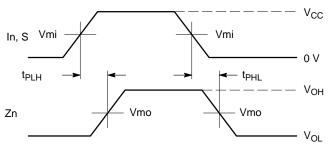
DYNAMIC SWITCHING CHARACTERISTICS

			T _A = +25°C			
Symbol	Characteristic	Condition	Min	Тур	Max	Unit
V _{OLP}	Dynamic LOW Peak Voltage	V_{CC} = 3.3 V, C_{L} = 50 pF, V_{IH} = 3.3 V, V_{IL} = 0 V		0.8		V
	(Note 4)	V_{CC} = 2.5 V, C_L = 30 pF, V_{IH} = 2.5 V, V_{IL} = 0 V		0.6		V
V _{OLV}	Dynamic LOW Valley Voltage	V_{CC} = 3.3 V, C_{L} = 50 pF, V_{IH} = 3.3 V, V_{IL} = 0 V		-0.8		V
	(Note 4)	V_{CC} = 2.5 V, C_L = 30 pF, V_{IH} = 2.5 V, V_{IL} = 0 V		-0.6		V

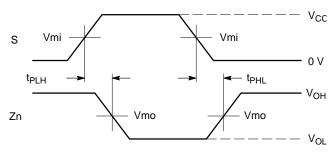
4. Number of outputs defined as "n". Measured with "n-1" outputs switching from HIGH-to-LOW or LOW-to-HIGH. The remaining output is measured in the LOW state.

CAPACITIVE CHARACTERISTICS

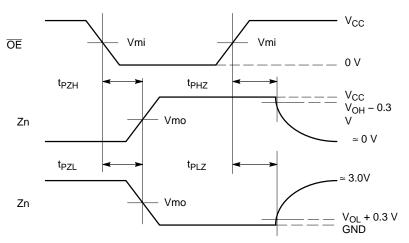
Symbol	Parameter	Parameter Condition		Unit
C _{IN}	Input Capacitance	V_{CC} = 3.3 V, V_{I} = 0 V or V_{CC}	7	pF
C _{I/O}	Input/Output Capacitance	V_{CC} = 3.3 V, V_{I} = 0 V or V_{CC}	8	pF
C _{PD}	Power Dissipation Capacitance	10 MHz, V_{CC} = 3.3 V, V_{I} = 0 V or V_{CC}	25	pF







WAVEFORM 2 – INVERTING PROPAGATION DELAYS $t_R = t_F = 2.5$ ns, 10% to 90%; f = 1.0 MHz; $t_W = 500$ ns





 t_{R} = t_{F} = 2.5 ns, 10% to 90%; f = 1.0 MHz; t_{W} = 500 ns

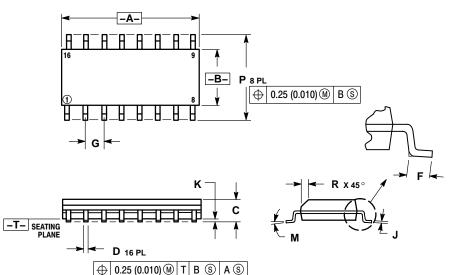
	Vcc					
Symbol	3.3 V <u>+</u> 0.3 V	2.7 V	2.5 V <u>+</u> 0.2 V			
Vmi	1.5 V	1.5 V	Vcc/2			
Vmo	1.5 V	1.5 V	Vcc/2			
V _{HZ}	V _{OL} + 0.3 V	V _{OL} + 0.3 V	V _{OL} + 0.15 V			
V _{LZ}	V _{OH} – 0.3 V	V _{OH} – 0.3 V	V _{OH} – 0.15 V			

Figure 3. AC Waveforms

http://onsemi.com

PACKAGE DIMENSIONS

SOIC-16 **D SUFFIX** CASE 751B-05 ISSUE J

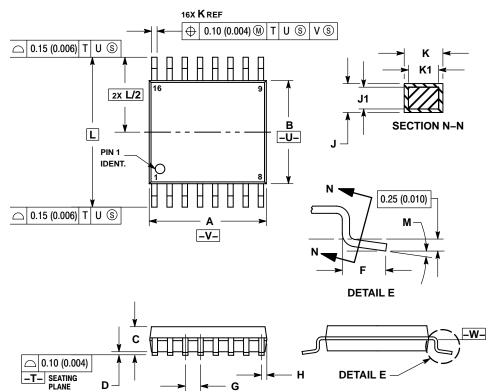


NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 1.
- 2 3.
- 114-3M, 1982. CONTROLLING DIMENSION: MILLIMETER. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION. MAXIMUM MOLD PROTRUSION 0.15 (0.006) DED SIDE 4.
- PER SIDE. DIMENSION D DOES NOT INCLUDE DAMBAR 5 PROTRUSION ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIN	IETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	9.80	10.00	0.386	0.393
В	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27	BSC	0.050	BSC
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
Μ	0 °	7°	0 °	7°
Ρ	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

TSSOP-16 **DT SUFFIX** CASE 948F-01 **ISSUE O**



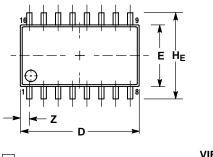
NOTES

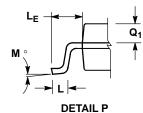
- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 CONTROLLING DIMENSION: MILLIMETER.
- DIMENSION A DOES NOT INCLUDE MOLD FLASH. PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 3.
- Onto PER SIDE.
 DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH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

	MILLIN	IETERS	INC	HES
DIM	MIN	MAX	MIN	MAX
Α	4.90	5.10	0.193	0.200
В	4.30	4.50	0.169	0.177
С		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	
Н	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		BSC
М	0°	8°	0°	8°

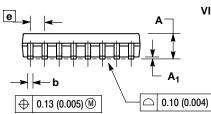
PACKAGE DIMENSIONS

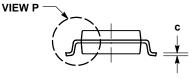
SOEIAJ-16 **M SUFFIX** CASE 966-01 ISSUE O











- NOTES: 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982. 2. CONTROLLING DIMENSION: MILLIMETER. 3. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS AND ARE MEASURED AT THE PARTING LINE. MOLD FLASH OR PROTRUSIONS SHALL NOT EXCEED 0.15 (0.006) PER SIDE. 4. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY. 5. THE LEAD WIDTH DIMENSION (b) DOES NOT INCLUDE DAMBAR PROTRUSION ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.08 (0.003) TOTAL IN EXCESS OF THE LEAD WIDTH DIMENSION AT MAXIMUM MATERIAL CONDITION. DAMBAR CANNOT BE LOCATED ON THE LOWER RADIUS OR THE FOOT. MINIMUM SPACE BETWEEN PROTRUSIONS AND ADJACENT LEAD TO BE 0.46 (0.018).

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
Α		2.05		0.081
A ₁	0.05	0.20	0.002	0.008
b	0.35	0.50	0.014	0.020
C	0.18	0.27	0.007	0.011
D	9.90	10.50	0.390	0.413
Е	5.10	5.45	0.201	0.215
e	1.27 BSC		0.050 BSC	
HE	7.40	8.20	0.291	0.323
L	0.50	0.85	0.020	0.033
LE	1.10	1.50	0.043	0.059
Μ	0 °	10 °	0 °	10 °
Q	0.70	0.90	0.028	0.035
Z		0.78		0.031

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