

Quad 2-Channel Multiplexer with 3-State Outputs

MC74LVX257

The MC74LVX257 is an advanced high speed CMOS quad 2-channel multiplexer fabricated with silicon gate CMOS technology.

It consists of four 2-input digital multiplexers with common select (S) and enable (\overline{OE}) inputs. When (\overline{OE}) is held High, selection of data is inhibited and all the outputs go Low.

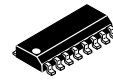
The select decoding determines whether the A or B inputs get routed to the corresponding Y outputs.

The inputs tolerate voltages up to 5.5 V, allowing the interface of 5.0 V systems to 3.0 V systems.

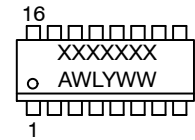
Features

- High Speed: $t_{PD} = 4.5$ ns (Typ) at $V_{CC} = 3.3$ V
- Low Power Dissipation: $I_{CC} = 4$ μ A (Max) at $T_A = 25$ °C
- High Noise Immunity: $V_{NIH} = V_{NIL} = 28\%$ V_{CC}
- Power Down Protection Provided on Inputs
- Balanced Propagation Delays
- Designed for 2.0 V to 5.5 V Operating Range
- Low Noise: $V_{OLP} = 0.8$ V (Max)
- Pin and Function Compatible with Other Standard Logic Families
- Latchup Performance Exceeds 100 mA
- Chip Complexity: FETs = 100; Equivalent Gates = 25
- ESD Performance:
Human Body Model > 2000 V;
- These Devices are Pb-Free and are RoHS Compliant

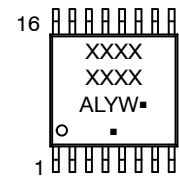
MARKING DIAGRAMS



SOIC-16
D SUFFIX
CASE 751B



TSSOP-16
DT SUFFIX
CASE 948F



XXXXXXX = Specific Device Code

A = Assembly Location

WL, L = Wafer Lot

Y = Year

WW, W = Work Week

G or ■ = Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

MC74LVX257

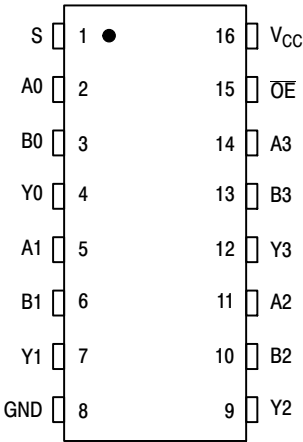


Figure 1. Pin Assignment

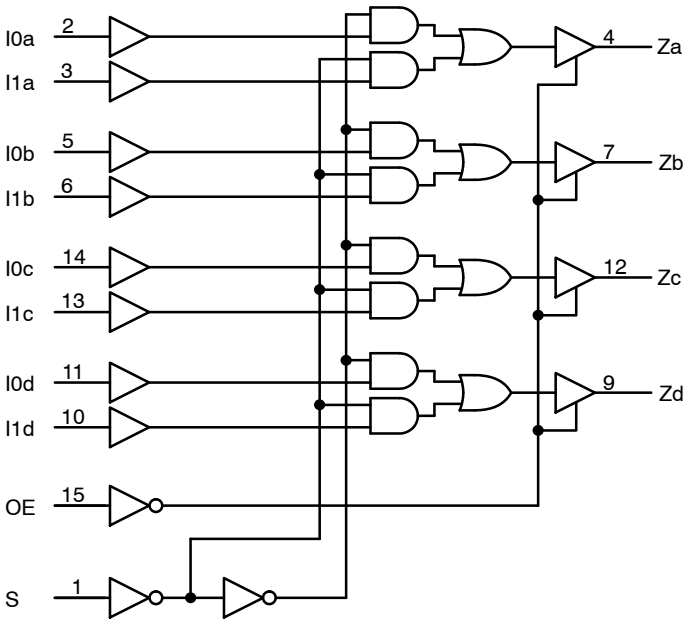


Figure 2. Expanded Logic Diagram

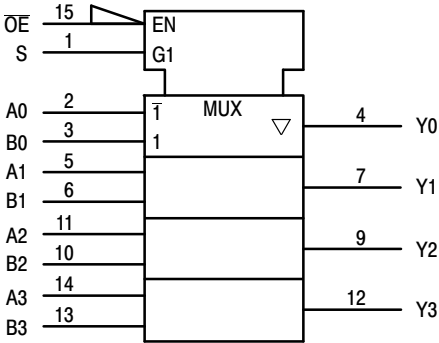


Figure 3. IEC Logic Symbol

FUNCTION TABLE

Inputs		Outputs Y0 – Y3
OE	S	
H	X	Z
L	L	A0 – A3
L	H	B0 – B3

A0 – A3, B0 – B3 = the levels of the respective Data-Word Inputs.

MC74LVX257

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	−0.5 to V _{CC} +0.5	V
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	±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 1) SOIC-16	126	°C/W
	TSSOP-16	159	
P _D	Power Dissipation in Still Air at 25 °C SOIC-16	995	mW
	TSSOP-16	787	
MSL	Moisture Sensitivity	Level 1	–
F _R	Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in	–
V _{ESD}	ESD Withstand Voltage (Note 2) Human Body Model	2000	V
	Charged Device Model	N/A	

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. 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.
2. 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.

RECOMMENDED OPERATING CONDITIONS

Symbol	Characteristics	Min	Max	Unit
V _{CC}	DC Supply Voltage	2.0	3.6	V
V _{IN}	DC Input Voltage	0	5.5	V
V _{OUT}	DC Output Voltage	0	V _{CC}	V
T _A	Operating Temperature Range, all Package Types	−40	85	°C
t _r , t _f	Input Rise or Fall Time V _{CC} = 3.3 V ± 0.3 V	0	100	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.

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DC CHARACTERISTICS (Voltages Referenced to GND)

Symbol	Parameter	Condition	V _{CC} (V)	T _A = 25 °C			-40 °C ≤ T _A ≤ 85 °C		Unit
				Min	Typ	Max	Min	Max	
V _{IH}	Minimum High-Level Input Voltage		2.0 3.0 3.6	0.75 V _{CC} 0.7 V _{CC} 0.7 V _{CC}			0.75 V _{CC} 0.7 V _{CC} 0.7 V _{CC}		V
V _{IL}	Maximum Low-Level Input Voltage		2.0 3.0 3.6			0.25 V _{CC} 0.3 V _{CC} 0.3 V _{CC}		0.25 V _{CC} 0.3 V _{CC} 0.3 V _{CC}	V
V _{OH}	High-Level Output Voltage	I _{OH} = -50 μA I _{OH} = -50 μA I _{OH} = -4 mA	2.0 3.0 3.0	1.9 2.9 2.58	2.0 3.0		1.9 2.9 2.48		V
V _{OL}	Low-Level Output Voltage	I _{OL} = 50 μA I _{OL} = 50 μA I _{OL} = 4 mA	2.0 3.0 3.0		0.0 0.0	0.1 0.1 0.36		0.1 0.1 0.44	V
I _{OZ}	Maximum 3-State Leakage Current	V _{IN} = V _{IH} or V _{IL} V _{OUT} = V _{CC} or GND	3.6			±0.1		±1.0	μA
I _{IN}	Input Leakage Current	V _{IN} = 5.5 V or GND	0 to 3.6			±0.1		±1.0	μA
I _{CC}	Maximum Quiescent Supply Current (per package)	V _{IN} = V _{CC} or GND	3.6	1.0	1.0	2.0		40	μA

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.

AC ELECTRICAL CHARACTERISTICS Input t_r = t_f = 3.0 ns

Symbol	Parameter	Test Conditions	T _A = 25 °C			-40 °C ≤ T _A ≤ 85 °C		Unit
			Min	Typ	Max	Min	Max	
t _{PLH} , t _{PHL}	Maximum Propagation Delay, A or B to Y	V _{CC} = 2.7 V C _L = 15 pF C _L = 50 pF		6.5 9.5	10.0 14.0	1.0 1.0	15.0 18.5	ns
		V _{CC} = 3.3 V ± 0.3 V C _L = 15 pF C _L = 50 pF		4.5 7.5	8.0 12.0	1.0 1.0	10.0 13.5	
t _{PLH} , t _{PHL}	Maximum Propagation Delay, S to Y	V _{CC} = 2.7 V C _L = 15 pF C _L = 50 pF		8.0 10.5	12.0 15.5	1.0 1.0	17.0 20.0	ns
		V _{CC} = 3.3 V ± 0.3 V C _L = 15 pF C _L = 50 pF		6.0 8.5	10.0 13.5	1.0 1.0	12.0 15.5	
t _{PZL} , t _{PZH}	Maximum Output Enable, Time, OE to Y	V _{CC} = 2.7 V C _L = 15 pF R _L = 1 kΩ C _L = 50 pF		7.5 10.5	11.5 15.0	1.0 1.0	16.5 18.0	ns
		V _{CC} = 3.3 V ± 0.3 V C _L = 15 pF R _L = 1 kΩ C _L = 50 pF		5.5 8.5	9.5 13.0	1.0 1.0	11.5 15.0	
t _{PLZ} , t _{PHZ}	Maximum Output Disable, Time, OE to Y	V _{CC} = 2.7 V C _L = 50 pF R _L = 1 kΩ		13.0	17.0	1.0	18.0	ns
		V _{CC} = 3.3 V ± 0.3 V C _L = 50 pF R _L = 1 kΩ		12	17.0	1.0	18.0	
C _{IN}	Maximum Input Capacitance			4	10		10	pF

C _{PD}	Power Dissipation Capacitance (Note 3)	Typical @ 25°C, V _{CC} = 3.3 V	pF
		20	

3. 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} • V_{CC} • f_{in} + I_{CC}. C_{PD} is used to determine the no-load dynamic power consumption; P_D = C_{PD} • V_{CC}² • f_{in} + I_{CC} • V_{CC}.

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NOISE CHARACTERISTICS Input $t_r = t_f = 3.0$ ns, $C_L = 50$ pF, $V_{CC} = 3.3$ V

Symbol	Characteristic	$T_A = 25^\circ\text{C}$		Unit
		Typ	Max	
V_{OLP}	Quiet Output Maximum Dynamic V_{OL}	0.3	0.5	V
V_{OLV}	Quiet Output Minimum Dynamic V_{OL}	-0.3	-0.5	V
V_{IHD}	Minimum High Level Dynamic Input Voltage		2.0	V
V_{ILD}	Maximum Low Level Dynamic Input Voltage		0.8	V

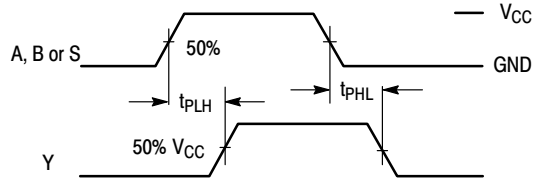


Figure 4. Switching Waveform

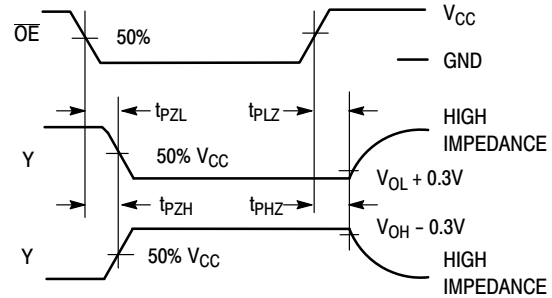
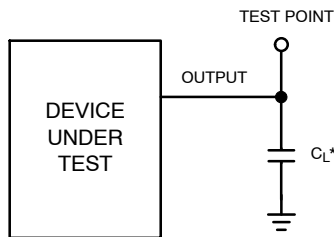
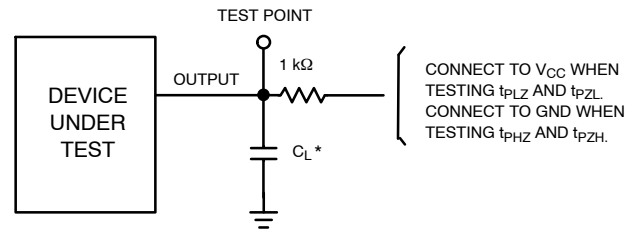


Figure 5. Switching Waveform



* Includes all probe and jig capacitance

Figure 6. Test Circuit



* Includes all probe and jig capacitance

Figure 7. Test Circuit

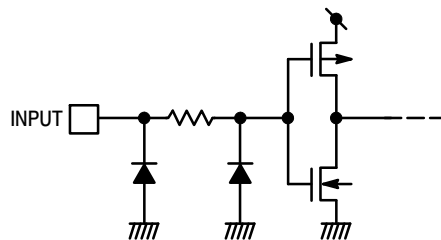


Figure 8. Input Equivalent Circuit

ORDERING INFORMATION

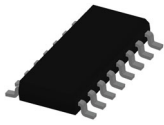
Device	Marking	Package	Shipping†
MC74LVX257DTR2G	LVX 257	TSSOP-16	2500 / Tape & Reel
MC74LVX257DR2G	LVX257G	SOIC-16	2500 / Tape & Reel

† 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](#).

MC74LVX257

REVISION HISTORY

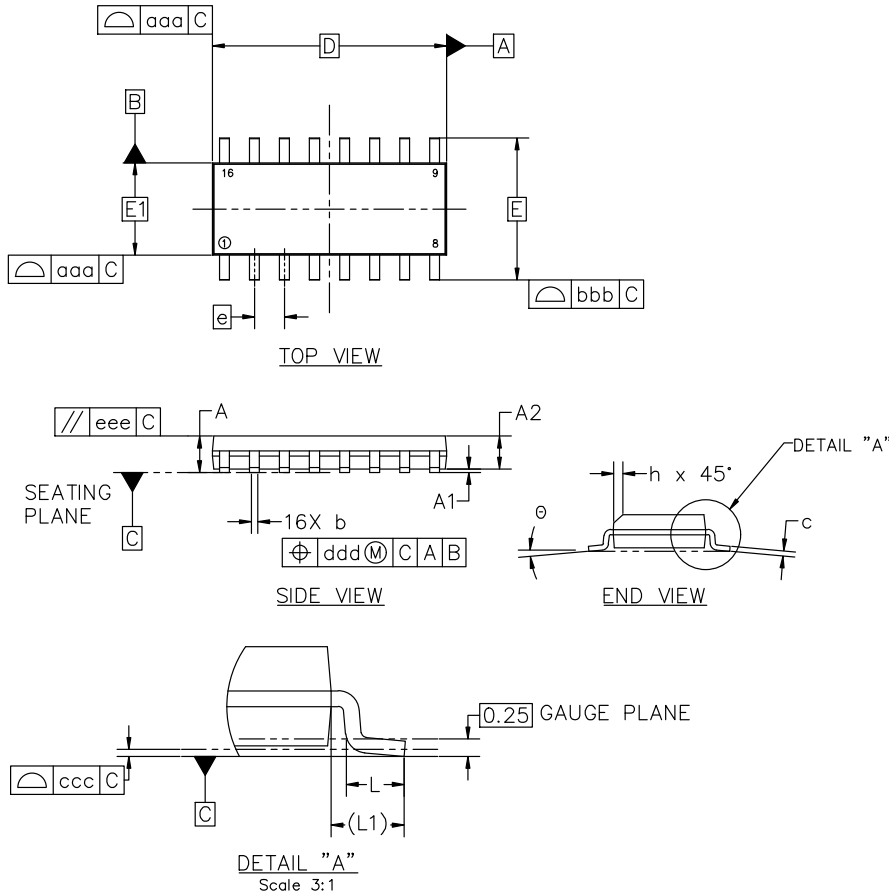
Revision	Description of Changes	Date
6	Modified voltage ratings from 7.0 V to 6.5 V. Rebranded the Data Sheet to onsemi format.	07/09/2025


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

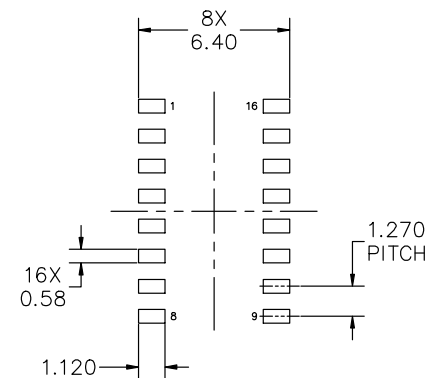
DATE 18 OCT 2024

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		



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

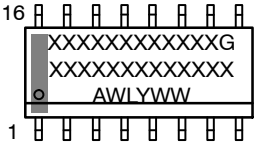
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SOIC-16 9.90x3.90x1.37 1.27P
CASE 751B
ISSUE M

DATE 18 OCT 2024

GENERIC
MARKING DIAGRAM*

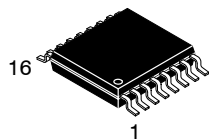


XXXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
Y = Year
WW = Work Week
G = Pb-Free Package

*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.

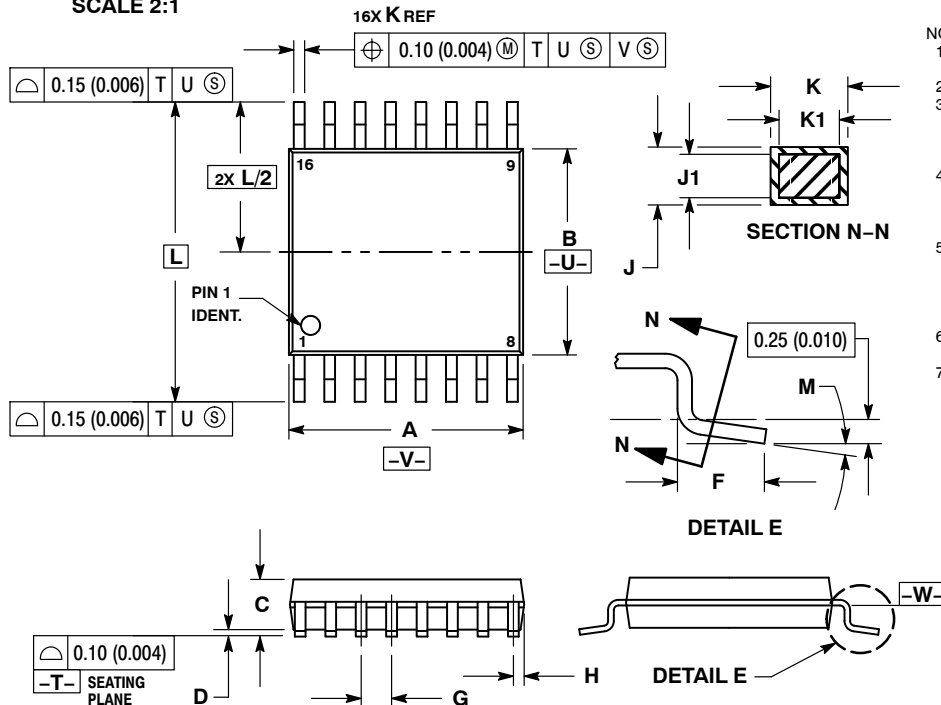
STYLE 1: PIN 1. COLLECTOR 2. BASE 3. EMITTER 4. NO CONNECTION 5. EMITTER 6. BASE 7. COLLECTOR 8. COLLECTOR 9. BASE 10. EMITTER 11. NO CONNECTION 12. EMITTER 13. BASE 14. COLLECTOR 15. EMITTER 16. COLLECTOR	STYLE 2: PIN 1. CATHODE 2. ANODE 3. NO CONNECTION 4. CATHODE 5. CATHODE 6. NO CONNECTION 7. ANODE 8. CATHODE 9. CATHODE 10. ANODE 11. NO CONNECTION 12. CATHODE 13. CATHODE 14. NO CONNECTION 15. ANODE 16. CATHODE	STYLE 3: PIN 1. COLLECTOR, DYE #1 2. BASE, #1 3. EMITTER, #1 4. COLLECTOR, #1 5. COLLECTOR, #2 6. BASE, #2 7. EMITTER, #2 8. COLLECTOR, #2 9. COLLECTOR, #3 10. BASE, #3 11. EMITTER, #3 12. COLLECTOR, #3 13. COLLECTOR, #4 14. BASE, #4 15. EMITTER, #4 16. COLLECTOR, #4	STYLE 4: PIN 1. COLLECTOR, DYE #1 2. COLLECTOR, #1 3. COLLECTOR, #2 4. COLLECTOR, #2 5. COLLECTOR, #3 6. COLLECTOR, #3 7. COLLECTOR, #4 8. COLLECTOR, #4 9. BASE, #4 10. EMITTER, #4 11. BASE, #3 12. EMITTER, #3 13. BASE, #2 14. EMITTER, #2 15. BASE, #1 16. EMITTER, #1
STYLE 5: PIN 1. DRAIN, DYE #1 2. DRAIN, #1 3. DRAIN, #2 4. DRAIN, #2 5. DRAIN, #3 6. DRAIN, #3 7. DRAIN, #4 8. DRAIN, #4 9. GATE, #4 10. SOURCE, #4 11. GATE, #3 12. SOURCE, #3 13. GATE, #2 14. SOURCE, #2 15. GATE, #1 16. SOURCE, #1	STYLE 6: PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. CATHODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE 15. ANODE 16. ANODE	STYLE 7: PIN 1. SOURCE N-CH 2. COMMON DRAIN (OUTPUT) 3. COMMON DRAIN (OUTPUT) 4. GATE P-CH 5. COMMON DRAIN (OUTPUT) 6. COMMON DRAIN (OUTPUT) 7. COMMON DRAIN (OUTPUT) 8. SOURCE P-CH 9. SOURCE P-CH 10. COMMON DRAIN (OUTPUT) 11. COMMON DRAIN (OUTPUT) 12. COMMON DRAIN (OUTPUT) 13. GATE N-CH 14. COMMON DRAIN (OUTPUT) 15. COMMON DRAIN (OUTPUT) 16. SOURCE N-CH	

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TSSOP-16 WB
CASE 948F
ISSUE B

DATE 19 OCT 2006

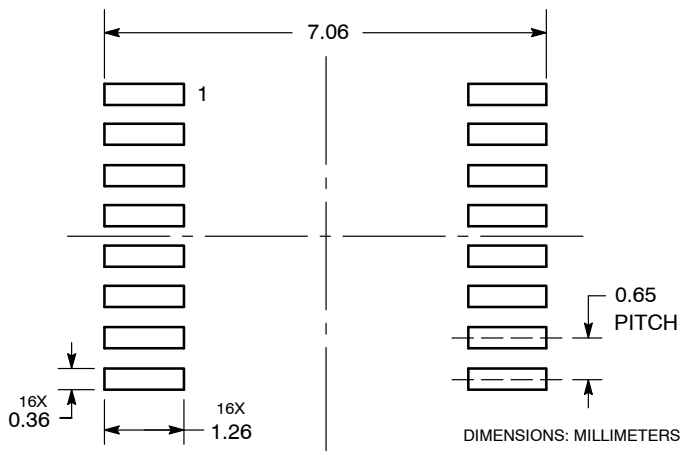


NOTES:

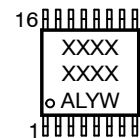
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD 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-.

DIM	MILLIMETERS		INCHES	
	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*



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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