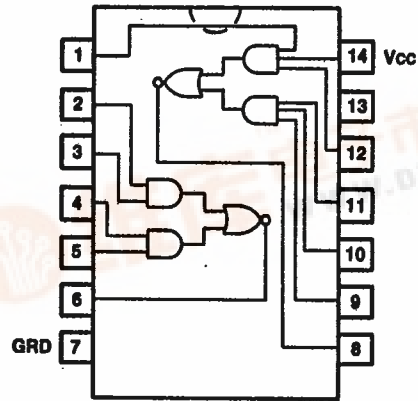


### WA-LS51, WP90224 List 4

#### Dual 2-Wide 2-Input/3-Input AND-OR-Inverter Gate

The LS51 is a bipolar, NPN, sealed-junction, silicon integrated circuit. It is manufactured in low-power Schottky technology and is available in a wire-bonded, 14-pin plastic DIP or surface mount package.



#### Electrical Characteristics

VCC = 5.0 ± 0.5 V, TA = -55 to +125°C (WA-LS)  
 VCC = 5.0 ± 0.25 V, TA = 0 to 70°C (WP)

Parameter	Symbol	WA-LS		WP		Units
		Min	Max	Min	Max	
Output Voltage, VCC = 4.5 V (WA-LS), VCC = 4.75 V (WP)						
Low, IOL = 4.0 mA	VOL	-	0.4	-	0.4	V
IOL = 8.0 mA	VOL	-	0.5	-	0.5	V
High, IOH = -0.4 mA	VOH	2.5	-	2.7	-	V
Input Voltage, VCC = 4.5 V (WA-LS), VCC = 4.75 V (WP)						
Low	VIL	-	0.7	-	0.8	V
High	VIH	2.0	7.5	2.0	5.5	V
Clamp, IIN = -18.0 mA	VIK	-	-1.5	-	-1.5	V
Input Current, VCC = 5.5 V (WA-LS), VCC = 5.25 V (WP)						
Low, VIL = 0.4 V	IIL	-	-0.4	-	-0.4	mA
High, VIH = 2.7 V	IiH	-	20.0	-	20.0	µA
@ Vi max, Vi = 7.0 V (WA-LS), Vi = 5.5 V (WP)	Ii	-	0.1	-	0.1	mA
Output Current, VCC = 5.5 V (WA-LS), VCC = 5.25 V (WP)						
Short-Circuit	Ios	-20.0	-100.0	-20.0	-100.0	mA
Supply Current, VCC = 5.5 V (WA-LS), VCC = 5.25 V (WP)						
Output Low	ICCL	-	2.8	-	2.8	mA
Output High	ICCH	-	1.6	-	1.6	mA



**Timing Characteristics**

VCC = 5.0 V, TA = 25°C, CL = 15 pF

		WA-LS		WP		
Parameter	Symbol	Min	Max	Min	Max	Units
Propagation Delay						
Low-to-High	tPLH	—	13.0	—	20.0	ns
High-to-Low	tPHL	—	14.0	—	20.0	ns

**Maximum Ratings\***

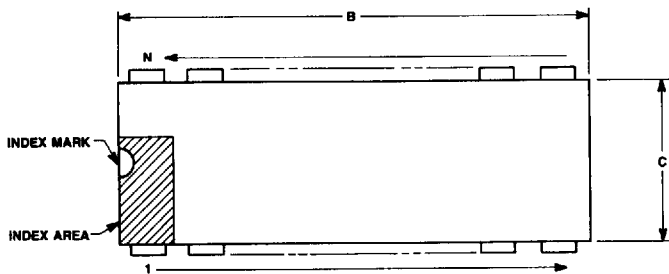
Power supply voltage (VCC)..... 7.0 V  
 Operating temperature (TA)..... -55 to +125°C (WA-LS), 0 to 70°C (WP)  
 Storage temperature (Tstg)\*\*..... -65 to +150°C

\* Maximum ratings are defined as the limiting conditions that the user can apply to the device under all variations of circuit and environmental conditions. If any rating is exceeded, permanent damage to the device may result.

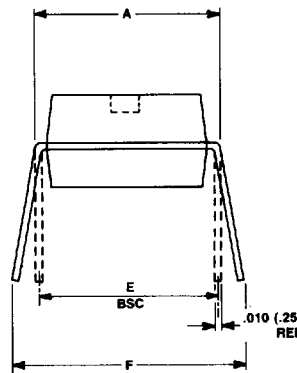
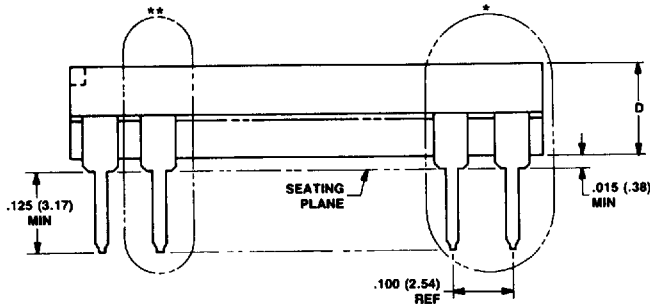
\*\* Bonding or soldering of the external leads of this device can be performed safely at temperatures up to 300°C.



**Packaging Information**



\* See End-Lead Configuration for Lead Dimensions (Refer to Detail  $\bar{A}$ ,  $\bar{B}$ ,  $\bar{C}$ ,  $\bar{D}$ )  
 \*\* See Center-Lead Configuration for Lead Dimensions (Refer to Detail  $\bar{E}$ ,  $\bar{F}$ ,  $\bar{G}$ )



**Postmolded Plastic DIP Dimensions†**

No. Leads	A Max	B Max	C Max	D Max	E BSC	F Max	Notes	Lead Configuration
14	.320 (8.13)	.795 (20.19)	.255 (6.48)	.140 (3.56)	.300 (7.62)	.400 (10.16)	1,2,3,4	$\bar{A}$ $\bar{B}$ $\bar{E}$ $\bar{G}$
16	.320 (8.13)	.795 (20.19)	.265 (6.73)	.140 (3.56)	.300 (7.62)	.400 (10.16)	1,2,3,4	$\bar{B}$ $\bar{C}$ $\bar{D}$ $\bar{E}$ $\bar{F}$ $\bar{G}$
20	.320 (8.13)	1.040 (26.42)	.255 (6.48)	.140 (3.56)	.300 (7.62)	.400 (10.16)	1,2,3,4	$\bar{A}$ $\bar{B}$ $\bar{D}$ $\bar{E}$ $\bar{F}$ $\bar{G}$

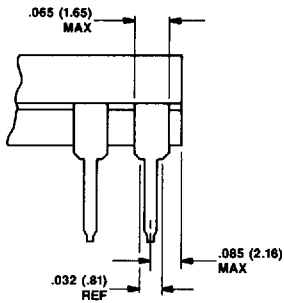
† Dimensions are in inches and (millimeters).

**Notes:**

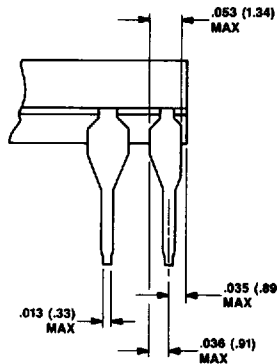
1. Meets JEDEC standards.
2. Index mark may be semicircular notch located in index area.
3. Index mark may be circular dimple located in index area.
4. Actual dimensions may vary depending on location of assembly, but all meet limits shown in table.

**Postmolded Plastic DIP Lead Configurations**

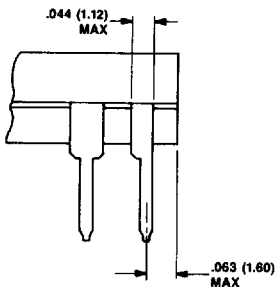
**End Leads**



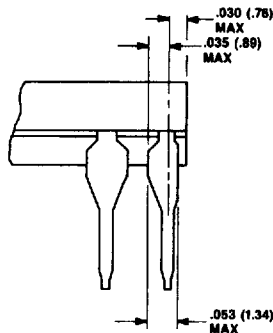
**Detail A: Full-Lead/Square Shoulder**



**Detail B: Full-Lead/Tapered Offset**

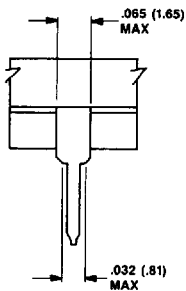


**Detail C: Half-Lead/Square Shoulder**

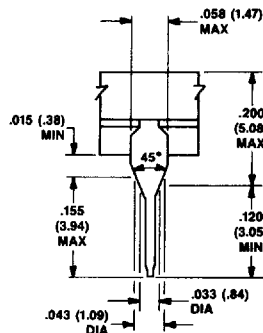


**Detail D: Half-Lead/Tapered**

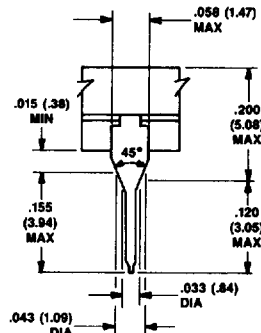
**Center Leads**



**Detail E: Square Shoulder**



**Detail F: Taper**



**Detail G: Taper**

Notes: Lead configurations vary depending on location of assembly.  
 Dimensions are in inches and (millimeters).