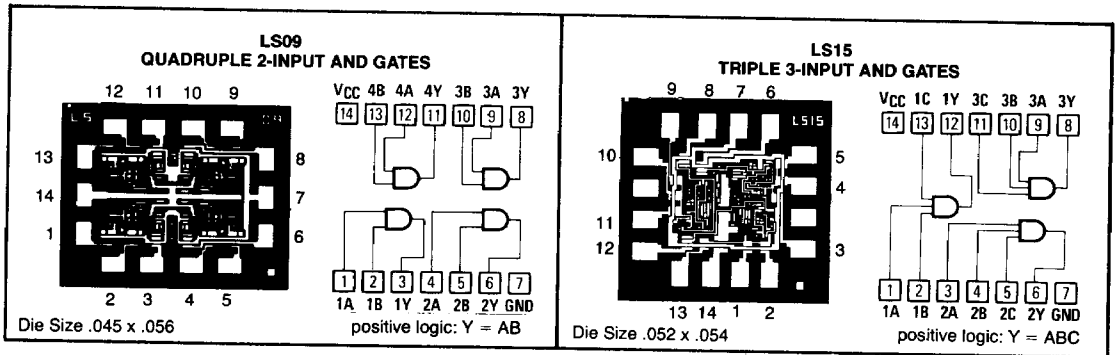


Positive-AND Gates With Open-Collector Outputs

LS09 LS15

PIN-OUT AND LOGIC DIAGRAMS



Recommended Operating Conditions

	9LS/54LS			9LS/74LS			Unit
	Min	Nom	Max	Min	Nom	Max	
Supply voltage, V_{CC} (See Note 1)	4.5	5	5.5	4.75	5	5.25	V
High-level output voltage, V_{OH}			5.5			5.5	V
Low-level output current, I_{OL}	-55		125	0		70	°C

NOTE 1: Voltage values are with respect to network ground terminal.

Electrical Characteristics Over Recommended Free-Air Temperature Range (Unless Otherwise Noted)

Parameter	Test Conditions*	9LS/54LS			9LS/74LS			Unit
		Min	Typ**	Max	Min	Typ**	Max	
V_{IH}		2			2			V
V_{IL}				0.7			0.8	V
V_I	$V_{CC} = \text{MIN}, I_I = -18\text{mA}$			-1.5			-1.5	V
V_{OH}	$V_{CC} = \text{MIN}, V_{OH} = 5.5\text{V}, V_{IH} = 2.0\text{V}$			100			100	μA
I_{OH}	$V_{CC} = \text{MIN}, V_{IL} = V_{IL\text{MAX}}$			0.25	0.25	0.4	0.4	V
							0.5	
I_I	$V_{CC} = \text{MAX}, V_I = 7.0\text{V}$			0.1			0.1	mA
I_{IH}	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$			20			20	μA
I_{IL}	$V_{CC} = \text{MAX}, V_I = 0.4\text{V}$			-0.4			-0.4	mA
I_{CCH}	$V_{CC} = \text{MAX},$ All inputs at 4.5V (Per Gate)		0.6	1.2		0.6	1.2	mA
I_{CCL}	$V_{CC} = \text{MAX},$ All inputs at 0V (Per Gate)		1.1	2.2		1.1	2.2	mA

*For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

**All typical values are at $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}$.

Switching Characteristics, $V_{CC} = 5\text{V}$ Over Recommended Free-Air Temperature Range

Parameter	-55°C			+25°C			+125°C			Unit
	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Test Conditions: $C_L = 15\text{pF}, R_L = 2\text{k}\Omega$ (See Fig. B, page 2-174)										
t_{PLH}		14	20		14	21		28	42	ns
t_{PHL}		10	15		8	12		9	13	ns
Test Conditions: $C_L = 50\text{pF}, R_L = 2\text{k}\Omega$ (See Fig. B, page 2-174)										
t_{PLH}		30	38		30	38		40	54	ns
t_{PHL}		16	23		12	17		13	17	ns

Note: AC specification shown under -55°C and $+125^\circ\text{C}$ are for 9LS devices only. All 50pF specifications are for 9LS devices only.