DESCRIPTION

The "182" is a high speed Look-Ahead Carry Generator ordinarily used with the "181" 4-Bit ALU or other arithmetic processing elements. This combination provides high speed Look-Ahead over word lengths of more than 4 bits.

The "182" accepts up to 4 pairs of active Low Carry Propagate and Carry Generate signals, an active High Carry input, and provides anticipated active High carries across 4 groups of binary adders.

Logic equations provided at the outputs are:

$$C_{n+x} = G_0 + P_0C_n$$

$$C_{n+y} = G_1 + P_1G_0 + P_1P_0C_n$$

$$C_{n+z} = G_2 + P_2G_1 + P_2P_1G_0 + P_2P_1P_0C_n$$

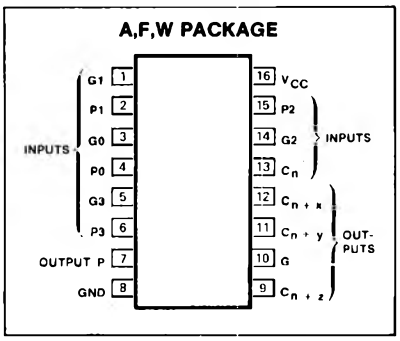
$$\overline{G} = \overline{G_3 + P_3G_2 + P_3P_2G_1 + P_3P_2P_1G_0}$$

$$\overline{P} = \overline{P_3P_2P_1P_0}$$

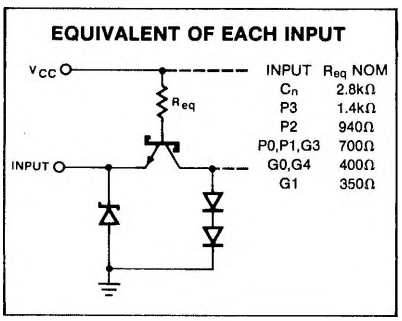
FEATURES

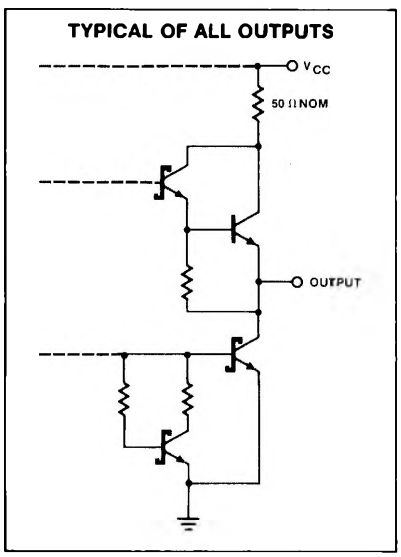
- **Provides look-ahead carries across a group of 4 ALU's**
- **Multi-level look-ahead for high speed arithmetic operation over long word lengths**

PIN CONFIGURATION



INPUT/OUTPUT SCHEMATICS





PIN DESIGNATION

PIN NOS.	DESIGNATION	FUNCTION
G0,G1,G2,G3	3,1,14,5	Active-Low Carry Generate Inputs
P0,P1,P2,P3	4,2,15,6	Active-Low Carry Propagate Inputs
C_n	13	Carry Input
C_{n+x}, C_{n+y}, C_{n+z}	12,11,9	Carry Outputs
G	10	Active-Low Carry Generate Output
P	7	Active-Low Carry Propagate Output
VCC	16	Supply Voltage
GND	8	Ground

DC ELECTRICAL CHARACTERISTICS

PARAMETER		TEST CONDITIONS	74S182			74S183			UNIT
			Min	Typ	Max	Min	Typ	Max	
V_{IL}	Input Low voltage	V_{CC} = Min			0.8		0.8		V
V_{IH}	Input High voltage	V_{CC} = Min	2.0			2.0			V
V_{CD}	Input clamp diode voltage	V_{CC} = Min, I_{IN} = -12mA			-1.5			-1.2	V
V_{OL}	Output Low voltage	V_{CC} = Min, I_{OL} = 16mA			0.4			0.5	V
V_{OH}	Output High voltage	V_{CC} = Min, I_{OH} = -800μA	2.4			2.7			V
I_{IH}	Input High current	V_{CC} = Max, V_{IN} = 2.4V							
	C_n input				80			50	μA
	P_2 input				160			150	μA
	P_3 input				120			100	μA
	P_0, P_1, G_3 input				200			200	μA
	G_0, G_2 input				360			350	μA
	G_1 input				400			400	μA
I_{IL}	Input Low current	V_{CC} = Max, V_{IN} = 0.4V							
	C_n input				-3.2			-2.0	mA
	P_2 input				-6.4			-6.0	mA
	P_3 input				-4.8			-4.0	mA
	P_9, P_1, G_3 input				-8.0			-8.0	mA
	G_0, G_2 input				-14.4			-14	mA
	G_1 input				-16			-16	mA
I_{OS}	Output short circuit current	V_{CC} = Max	-40		-100	-40		-100	mA
I_{CC}	Power supply current	V_{CC} = Max, V_{IN} = 5V			72			109	mA

AC ELECTRICAL CHARACTERISTICS T_A = 25°C, V_{CC} = +5V unless otherwise specified.

PARAMETER		TO	FROM	TEST CONDITIONS	54/74			54/74S			UNIT
					Min	Typ	Max	Min	Typ	Max	
	Propagation delay time										
t_{PLH}	Low to high					11	17				ns
t_{PHL}	High to low					15	22				
t_{PLH}	Low to high	G0, G1, G2	C_{n+x},						4.5	7	
		G3, P0, P1	C_{n+y}						4.5	7	
t_{PHL}	High to low	P2, P3	C_{n+z}	C_L = 15pF							
t_{PLH}	Low to high	G0, G1, G2,	G	R_L = 400Ω[1]					5	7.5	
		G3, P1, P2		R_L = 280Ω[2]					7	10.5	
t_{PHL}	High to low	P3									
t_{PLH}	Low to high	P0, P1, P2	P						4.5	6.5	
		P3									
t_{PHL}	High to low								6.5	10	
t_{PLH}	Low to high	C_n	C_{n+x},						6.5	10	
			C_{n+y}								
t_{PHL}	High to low		C_{n+z}						7	10.5	

NOTES

Load circuit and typical waveforms are shown at the front of section.

1. R_L = 400Ω for 54/74.
2. R_L = 280Ω for 54/74S.

LOGIC DIAGRAM