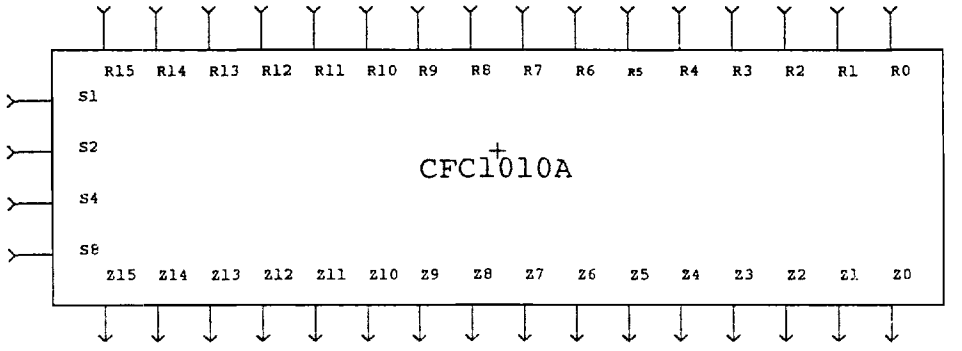
CFC1010A 16-bit Barrel Shifter

DESCRIPTION: CFC1010A performs a 16-bit end-around shift, or what is commonly known as a barrel shift. There are four control lines (S1, S2, S4, and S8) to determine how many places to the left the 16-bit inputs (R15 through R0) will be shifted at the outputs (Z15 through Z0). All outputs are in-phase with the inputs.

LOGIC SYMBOL:



INPUTS (LOADING IN TRANSISTOR PAIRS):
R15(8), R14(8), R13(8), R12(8), R11(8), R10(8), R9(8), R8(8),
R7(8), R6(8), R5(8), R4(8), R3(8), R2(8), R1(8), R0(8),
S1(4.5), S2(4.5), S4(4.5), S8(4.5)

OUTPUTS (DRIVE IN (#P,#N)):
Z15(0.5,0.5), Z14(0.5,0.5), Z13(0.5,0.5), Z12(0.5,0.5),
Z11(0.5,0.5), Z10(0.5,0.5), Z9(0.5,0.5), Z8(0.5,0.5)
Z7(0.5,0.5), Z6(0.5,0.5), Z5(0.5,0.5), Z4(0.5,0.5),
Z3(0.5,0.5), Z2(0.5,0.5), Z1(0.5,0.5), Z0(0.5,0.5)

GATE COUNT: GATES USED = 145
AREA USED = 146

TRUTH TABLE:

S8	S4	S2	S1	Z15	Z14	Z13	Z12	Z11	Z10	Z9	Z8	Z7	Z6	Z5	Z4	Z3	Z2	Z1	Z0
0	0	0	0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0
0	0	0	1	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15
0	0	1	0	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14
0	0	1	1	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13
0	1	0	0	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12
0	1	0	1	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11
0	1	1	0	R9	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10
0	1	1	1	R8	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9
1	0	0	0	R7	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8
1	0	0	1	R6	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7
1	0	1	0	R5	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6
1	0	1	1	R4	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5
1	1	0	0	R3	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4
1	1	0	1	R2	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3
1	1	1	0	R1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2
1	1	1	1	R0	R15	R14	R13	R12	R11	R10	R9	R8	R7	R6	R5	R4	R3	R2	R1

AC CHARACTERISTICS:

PATH	10K TYP.DELAY(NS)
R(I) TO OUTPUT Z(I)	5.6
S(I) TO OUTPUT Z(I)	7.8

* ASSUMING OUTPUT LOADING OF 3