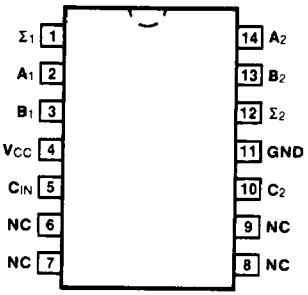
54/7482

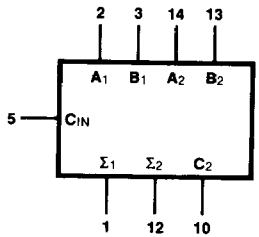
2-BIT FULL ADDER

CONNECTION DIAGRAM
PINOUT A



DESCRIPTION — The '82 is a full adder which performs the addition of two 2-bit binary numbers. The sum (Σ) outputs are provided for each bit and the resultant carry (C_2) is obtained from the second bit. Designed for medium to high speed, multiple-bit, parallel-add/serial-carry applications, the circuit utilizes high speed, high fan-out TTL. The implementation of a single-inversion, high speed, Darlington-connected serial-carry circuit within each bit minimizes the necessity for extensive "lookahead" and carry-cascading circuits.

LOGIC SYMBOL



V_{CC} = Pin 14
GND = Pin 11
NC = Pins 6,7,8,9

ORDERING CODE: See Section 9

PKGS	PIN OUT	COMMERCIAL GRADE V_{CC} = +5.0 V ±5%, T_A = 0°C to +70°C	MILITARY GRADE V_{CC} = +5.0 V ±10%, T_A = -55°C to +125°C	PKG TYPE
Plastic DIP (P)	A	7482PC		9A
Ceramic DIP (D)	A	7482DC	5482DM	6A
Flatpak (F)	A	7482FC	5482FM	3I

INPUT LOADING/FAN-OUT: See Section 3 for U.L. definitions

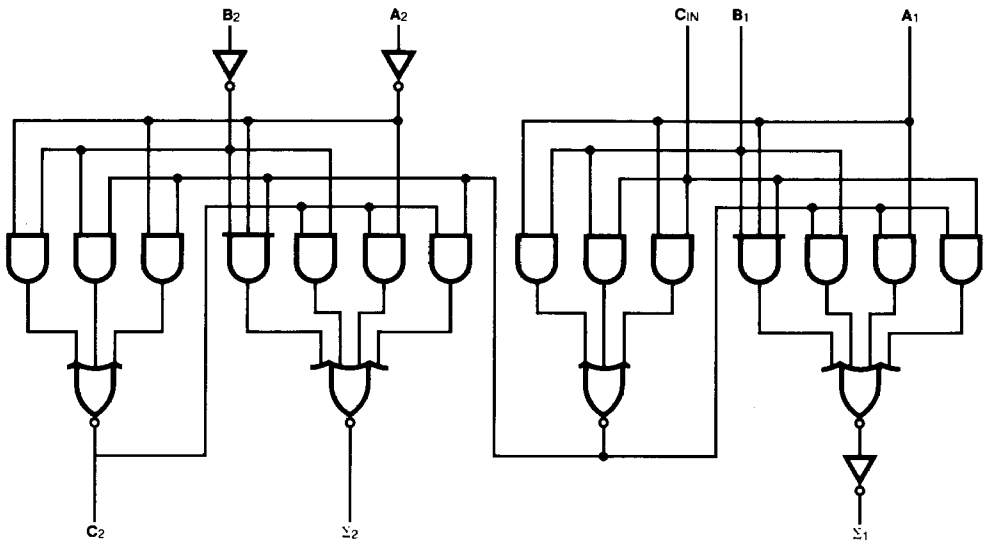
PIN NAMES	DESCRIPTION	54/74 (U.L.) HIGH/LOW
A_1, B_1	Bit 1 Operand Inputs	4.0/4.0
A_2, B_2	Bit 2 Operand Inputs	1.0/1.0
C_{IN}	Bit 1 Carry Input	4.0/4.0
Σ_1	Bit 1 Sum Output	10/10
Σ_2	Bit 2 Sum Output	10/10
C_2	Bit 2 Carry Output	5.0/5.0

TRUTH TABLE

INPUTS				OUTPUTS					
				$C_{IN} = 0$			$C_{IN} = 1$		
A_1	B_1	A_2	B_2	Σ_1	Σ_2	C_2	Σ_1	Σ_2	C_2
L	L	L	L	L	L	L	H	L	L
H	L	L	L	H	L	L	L	H	L
L	H	L	L	H	L	L	L	H	L
H	H	L	L	L	H	L	H	H	L
L	L	H	L	L	H	L	H	H	L
H	L	H	L	H	H	L	L	L	H
L	H	H	L	H	H	L	L	L	H
H	H	H	L	L	L	H	H	L	H
L	L	L	H	L	H	L	H	H	L
H	L	L	H	H	H	L	L	L	H
L	H	L	H	H	H	L	L	L	H
H	H	L	H	L	L	H	H	L	H
L	L	H	H	L	L	H	H	L	H
H	L	H	H	H	L	H	L	H	H
L	H	H	H	H	L	H	L	H	H
H	H	H	H	L	H	H	H	H	H

H = HIGH Voltage Level
L = LOW Voltage Level

LOGIC DIAGRAM



DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER		54/74 Min	54/74 Max	UNITS	CONDITIONS
Ios	Output Short Circuit Current at Σ_n	XM	-20	-55	mA	V_{CC} = Max
		XC	-18	-55		
Ios	Output Short Circuit Current at C_2	XM	-20	-70	mA	V_{CC} = Max
		XC	-18	-70		
Icc	Power Supply Current	XM		50	mA	V_{CC} = Max; A_1, A_2, C_{IN} = 4.5 V; B_1, B_2 = Gnd
		XC		58		

AC CHARACTERISTICS: V_{CC} = +5.0 V, T_A = +25° C (See Section 3 for waveforms and load configurations)

SYMBOL	PARAMETER	54/74 C_L = 15 pF R_L = 400 Ω Min	54/74 C_L = 15 pF R_L = 400 Ω Max	UNITS	CONDITIONS
t_{PLH} t_{PHL}	Propagation Delay C_{IN} to Σ_1		34 40	ns	Figs. 3-1, 3-20
t_{PLH} t_{PHL}	Propagation Delay B_2 to Σ_2		40 35	ns	Figs. 3-1, 3-20
t_{PLH} t_{PHL}	Propagation Delay C_{IN} to Σ_2		38 42	ns	Figs. 3-1, 3-20
t_{PLH} t_{PHL}	Propagation Delay C_{IN} to C_2		19 27	ns	Figs. 3-1, 3-5 R_L = 780 Ω