



SN54LS385 SN74LS385

DESCRIPTION — The SN54LS/74LS385 is a general-purpose adder/subtractor which is useful as a companion part to the SN54LS/74LS384 two's-complement multiplier. The LS385 contains four independent adder/subtractor elements with common clock and clear.

Each of four independent sum (Σ) outputs reflects the respective A and B input and is controlled by the S/A pin.

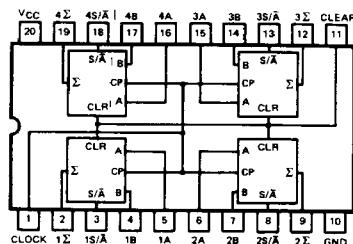
When low, the clear input asynchronously resets the sum flip-flop low and the carry flip-flop either high in the subtract mode or low in the add mode. The clock is positive-edge triggered and controls the sum and carry flip-flops.

- FOUR SYNCHRONOUS ELEMENTS IN A SINGLE 20-PIN PACKAGE
- INDEPENDENT TWO'S-COMPLEMENT ADDITION/SUBTRACTION
- BUFFERED CLOCK AND DIRECT CLEAR INPUTS

QUADRUPLE SERIAL ADDERS/SUBTRACTORS

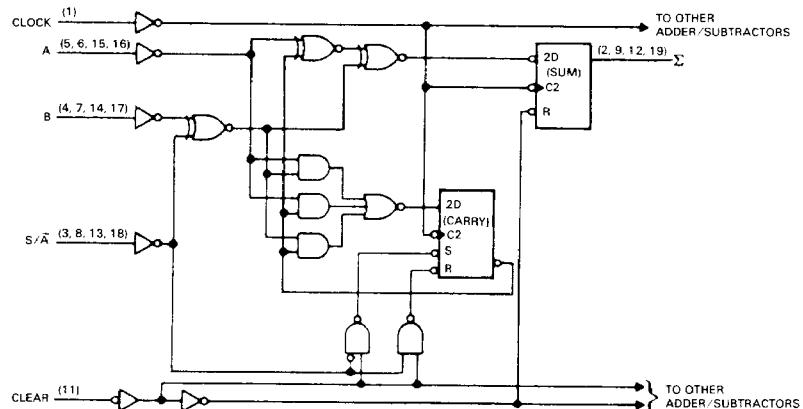
LOW POWER SCHOTTKY

CONNECTION DIAGRAM DIP (TOP VIEW)



J Suffix — Case 732-03 (Ceramic)
N Suffix — Case 738-01 (Plastic)

BLOCK DIAGRAM



FUNCTION TABLE

SELECTED FUNCTION	INPUTS				INTERNAL CARRY D INPUT BEFORE †	OUTPUT AFTER †
	CLEAR	S/A	A	B	CLOCK	
Clear	L	L	X	X	L	L
Add	L	H	X	X	H	L
	H	L	L	L	L	L
	H	L	L	H	H	H
	H	L	L	H	L	L
	H	L	H	L	H	L
	H	L	H	L	L	H
	H	L	H	H	H	L
	H	L	H	H	L	H
Subtract	H	H	L	L	L	H
	H	H	L	L	H	L
	H	H	L	H	L	L
	H	H	H	L	L	H
	H	H	H	L	H	L
	H	H	H	H	L	H
	H	H	H	H	H	L
	H	H	H	H	L	H

H = high level, L = low level, X = irrelevant.

† = transition from low to high level at the clock input

GUARANTEED OPERATING RANGES

SYMBOL	PARAMETER		MIN	TYP	MAX	UNIT
V _{CC}	Supply Voltage	54 74	4.5 4.75	5.0 5.0	5.5 5.25	V
T _A	Operating Ambient Temperature Range	54 74	-55 0	25 25	125 70	°C
I _{OH}	Output Current — High	54,74			-0.4	mA
I _{OL}	Output Current — Low	54 74			4.0 8.0	mA

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

SYMBOL	PARAMETER	LIMITS			UNITS	TEST CONDITIONS
		MIN	TYP	MAX		
V _{IH}	Input HIGH Voltage	2.0			V	Guaranteed Input HIGH Voltage for All Inputs
V _{IL}	Input LOW Voltage	54		0.7	V	Guaranteed Input LOW Voltage for All Inputs
		74		0.8		
V _{IK}	Input Clamp Diode Voltage		-0.65	-1.5	V	V _{CC} = MIN, I _{IN} = -18 mA
V _{OH}	Output HIGH Voltage	54	2.5	3.5	V	V _{CC} = MIN, I _{OH} = MAX, V _{IN} = V _{IH} or V _{IL} per Truth Table
		74	2.7	3.5	V	
V _{OL}	Output LOW Voltage	54,74	0.25	0.4	V	I _{OL} = 4.0 mA
		74	0.35	0.5	V	I _{OL} = 8.0 mA
I _{IH}	Input HIGH Current			20	μA	V _{CC} = MAX, V _{IN} = 2.7 V
				0.1	mA	V _{CC} = MAX, V _{IN} = 7.0 V
I _{IL}	Input LOW Current			-0.4	mA	V _{CC} = MAX, V _{IN} = 0.4 V
I _{OS}	Short Circuit Current	-20		-100	mA	V _{CC} = MAX
I _{CC}	Power Supply Current			75	mA	V _{CC} = MAX

AC CHARACTERISTICS: T_A = 25°C, V_{CC} = 5.0 V

SYMBOL	PARAMETER	LIMITS			UNITS	TEST CONDITIONS
		MIN	TYP	MAX		
t _{MAX}	Maximum Clock Frequency	30	40		MHz	V _{CC} = 5.0 V C _L = 15 pF
t _{PLH}	Propagation Delay, Clock to Σ		14	22	ns	
			18	27	ns	
t _{PHL}	Propagation Delay Clear to Σ		18	30	ns	

AC SETUP REQUIREMENTS: T_A = 25°C, V_{CC} = 5.0 V

SYMBOL	PARAMETER	LIMITS			UNITS	TEST CONDITIONS
		MIN	TYP	MAX		
t _W	Clock Pulse Width	16			ns	V _{CC} = 5.0 V
t _S	Setup Time	10			ns	
t _H	Hold Time	0			ns	