

HD100183

2 × 8-bit Recode Multiplier

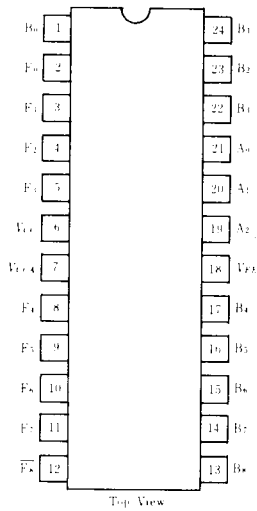
The HD100183 is a 2 × 8-bit recode multiplier designed to perform high-speed hardware multiplication.

In conjunction with the HD100182 Wallace Tree Adder, the HD100179 Carry Lookahead, and the

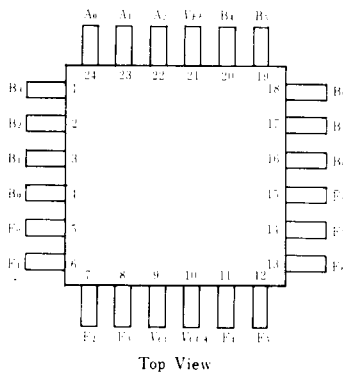
HD100180 High-speed Adder, the HD100183 performs parallel multiplication of two signed numbers in two's complement form to produce a signed two's complement product.

■ PIN ARRANGEMENT

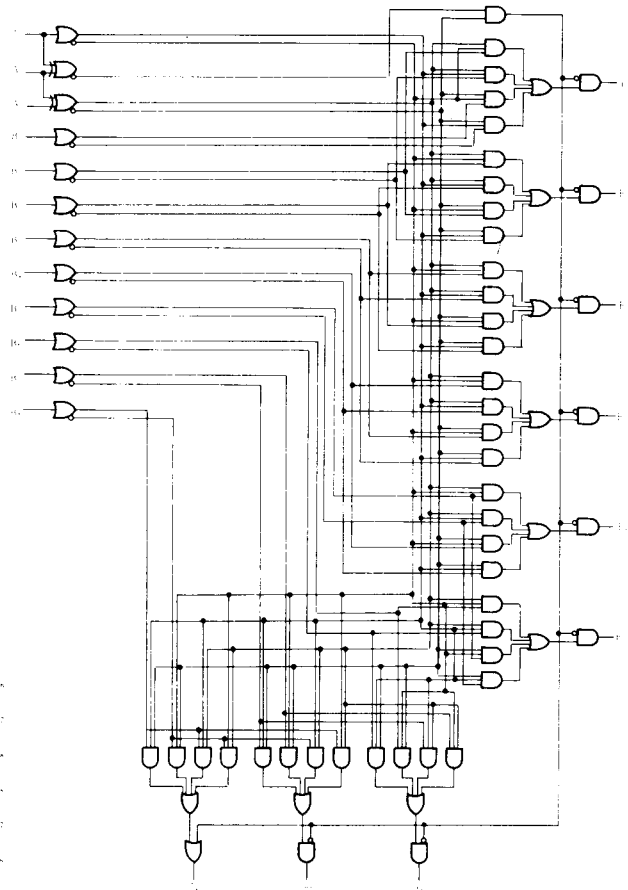
● HD100183



● HD100183F



■ LOGIC DIAGRAM



■ TRUTH TABLE

Inputs			Recode Mode	Outputs								
A ₀	A ₁	A ₂		F ₀	F ₁	F ₂	F ₃	F ₄	F ₅	F ₆	F ₇	F ₈
L	L	L	0	L	L	L	L	L	L	L	L	L
H	L	L	+1	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₈	$\overline{B_8}$
L	H	L	+1	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₈	$\overline{B_8}$
H	H	L	+2	B ₀	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	$\overline{B_8}$
L	L	H	-2	$\overline{B_0}$	$\overline{B_1}$	$\overline{B_2}$	$\overline{B_3}$	$\overline{B_4}$	$\overline{B_5}$	$\overline{B_6}$	$\overline{B_7}$	B ₈
H	L	H	-1	$\overline{B_1}$	$\overline{B_2}$	$\overline{B_3}$	$\overline{B_4}$	$\overline{B_5}$	$\overline{B_6}$	$\overline{B_7}$	$\overline{B_8}$	B ₈
L	H	H	-1	$\overline{B_1}$	$\overline{B_2}$	$\overline{B_3}$	$\overline{B_4}$	$\overline{B_5}$	$\overline{B_6}$	$\overline{B_7}$	$\overline{B_8}$	B ₈
H	H	H	0	L	L	L	L	L	L	L	L	H

■ DC CHARACTERISTICS (V_{EE} = -4.2 to -4.8V, V_{CC} = V_{CCA} = GND, T_a = 0 to +85°C)

Item	Symbol	Test Conditions	min	typ	max	Unit	
Supply Current	I _{EE}	All inputs open	115	170	250	mA	
Input Current	I _{IH}	V _{IN} = V _{IH max}	B ₀ ~ B ₈	—	—	215	μA
			A ₀	—	—	215	
			A ₁	—	—	285	
			A ₂	—	—	310	

Notes) As for other items, refer to the "Common DC Characteristics".

■ AC CHARACTERISTICS (V_{EE} = -2.2 to -2.8V, V_{CC} = V_{CCA} = 2.0V)

● HD100183

Item	Symbol	Test Condition	0°C		25°C			85°C		Unit	
			min	max	min	typ	max	min	max		
Propagation Delay Time	t _{PLH} t _{PHL}	See test circuit and waveform	A ₀ ~ A ₂ → F ₀ ~ F ₇	1.10	3.90	1.10	2.20	3.80	1.10	4.20	ns
			A ₀ ~ A ₂ → F ₈	0.90	3.20	1.00	1.60	3.10	1.00	3.60	
			B ₀ ~ B ₈ → F ₀ ~ F ₇	0.80	2.20	0.90	1.40	2.15	0.90	2.50	
			B ₈ → F ₈	0.80	2.00	0.90	1.30	2.00	0.90	2.50	
Transition Time	t _{FLH} t _{THL}			0.35	2.50	0.35	0.75	2.40	0.35	2.60	ns

● HD100183F

Item	Symbol	Test Condition	0°C		25°C			85°C		Unit	
			min	max	min	typ	max	min	max		
Propagation Delay Time	t _{PLH} t _{PHL}	See test circuit and waveform	A ₀ ~ A ₂ → F ₀ ~ F ₇	1.10	3.70	1.10	2.20	3.60	1.10	4.00	ns
			A ₀ ~ A ₂ → F ₈	0.90	3.00	1.00	1.60	2.90	1.00	3.80	
			B ₀ ~ B ₈ → F ₀ ~ F ₇	0.80	2.00	0.90	1.40	1.95	0.90	2.30	
			B ₈ → F ₈	0.80	1.80	0.90	1.30	1.80	0.90	2.30	
Transition Time	t _{TLH} t _{THL}			0.30	2.40	0.30	0.75	2.30	0.30	2.50	ns

Note) The circuit in a test socket or mounted on a printed circuit board and transverse air flow greater than 2.5m/s (500 linear fpm) is maintained.