

Signetics

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FAST Products	

FEATURES

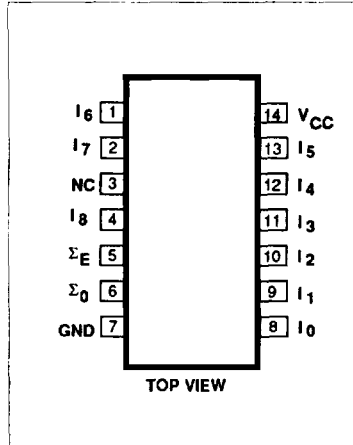
- High impedance NPN base inputs for reduced loading (20 μ A in Low and High states)
- Buffered inputs--one normalized load
- Word length easily expanded by cascading
- Industrial temperature range available (-40°C to +85°C) for 74F280B

DESCRIPTION

The 74F280A is a 9-bit Parity Generator or Checker commonly used to detect errors in high speed data transmission or data retrieval systems. Both Even (Σ_E) and Odd (Σ_O) parity outputs are available for generating and checking even or odd parity on up to 9 bits.

The Even (Σ_E) parity output is High when an even number of data inputs (I_0-I_8) are High. The Odd (Σ_O) parity output is High when an odd number of data inputs are High.

PIN CONFIGURATION



FAST 74F280A, 74F280B

Parity Checker Generator

9-Bit Odd/Even Parity Generator/Checker

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F280A	6.5ns	26mA
74F280B	5.5ns	26mA

ORDERING INFORMATION

PACKAGES	COMMERCIAL RANGE	INDUSTRIAL RANGE
	$V_{CC} = 5V \pm 10\%$ $T_A = 0^\circ C \text{ to } +70^\circ C$	$V_{CC} = 5V \pm 10\%$ $T_A = -40^\circ C \text{ to } +85^\circ C$
14-Pin Plastic DIP	N74F280AN, N74F280BN	174F280BN
14-Pin Plastic SO	N74F280AD, N74F280BD	174F280BD

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
I_0-I_8	Data inputs	1.0/0.033	20 μ A/20 μ A
Σ_E, Σ_O	Parity outputs	50/33	1.0mA/20mA

NOTE:

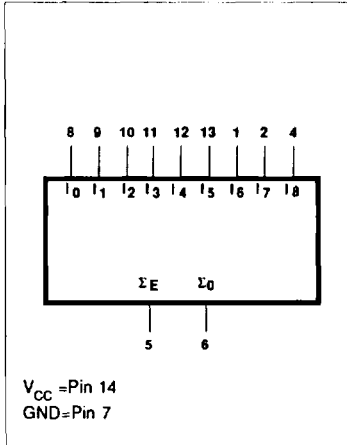
One (1.0) FAST Unit Load is defined as: 20 μ A in the High state and 0.6mA in the Low state.

Expansion to larger word sizes is accomplished by tying the Even (Σ_E) outputs of up to nine parallel devices to the data inputs of the

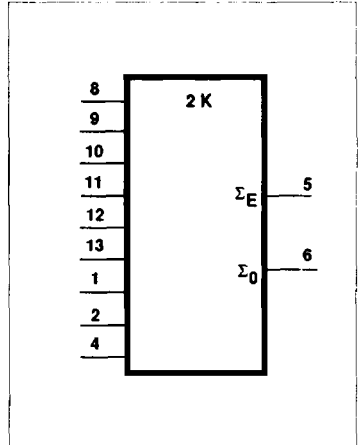
final stage. This expansion scheme allows an 81-bit data word to be checked in less than 20 ns.

The 74F280B is a faster version of 74F280A

LOGIC SYMBOL



LOGIC SYMBOL(IEEE/IEC)



Parity Generator Checker

FAST 74F280A, 74F280B

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER		LIMITS			UNIT
			Min	Nom	Max	
V_{CC}	Supply voltage		4.5	5.0	5.5	V
V_H	High-level input voltage		2.0			V
V_L	Low-level input voltage				0.8	V
I_{IK}	Input clamp current				-18	mA
I_{OH}	High-level output current				-1	mA
I_{OL}	Low-level output current				20	mA
T_A	Operating free-air temperature range	Commercial range	0		70	°C
		Industrial range	-40		85	°C

DC ELECTRICAL CHARACTERISTICS (Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER		TEST CONDITIONS ¹	LIMITS			UNIT	
				Min	Typ ²	Max		
V_{OH}	High-level output voltage		$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$	2.5		V	
			$V_{IH} = \text{MIN}, I_{OH} = \text{MAX}$	$\pm 5\%V_{CC}$	2.7	3.4	V	
V_{OL}	Low-level output voltage		$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}$	$\pm 10\%V_{CC}$		0.35	0.50	V
			$V_{IH} = \text{MIN}, I_{OL} = \text{MAX}$	$\pm 5\%V_{CC}$		0.35	0.50	V
V_{IK}	Input clamp voltage							
I_{IK}	Input current at maximum input voltage		$V_{CC} = \text{MIN}, I_I = I_{IK}$			-0.73	-1.2	V
I_I			$V_{CC} = 0.0V, V_I = 7.0V$				100	μA
I_{IH}	High-level input current	Commercial range Industrial range	$V_{CC} = \text{MAX}, V_I = 2.7V$				20	μA
	Low-level input current						40	μA
I_{IL}	Short-circuit output current ³		$V_{CC} = \text{MAX}, V_I = 0.5V$				-20	μA
I_{OS}	Supply current (total)		$V_{CC} = \text{MAX}$		-60		-150	mA
I_{CC}			$V_{CC} = \text{MAX}$			26	35	mA

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at $V_{CC} = 5V, T_A = 25^\circ C$.
- Not more than one output should be shorted at a time. For testing I_{OS} , the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a High output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I_{OS} tests should be performed last.

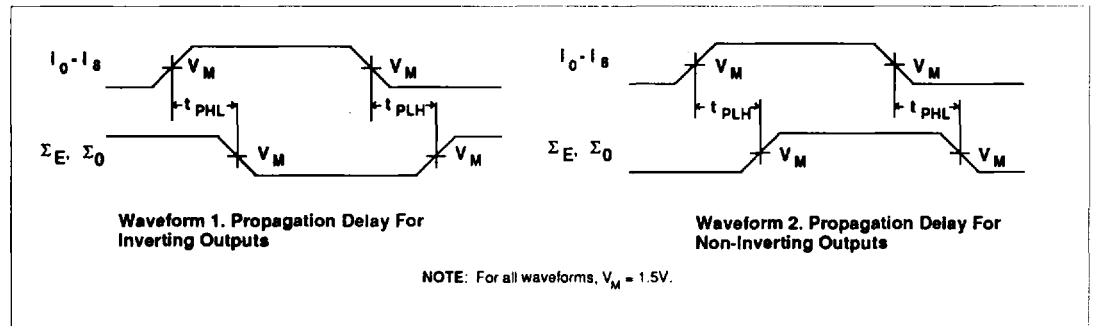
Parity Generator Checker

FAST 74F280A, 74F280B

AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS						UNIT		
			$T_A = +25^\circ\text{C}$			$T_A = 0^\circ\text{C to } +70^\circ\text{C}$		$T_A = -40^\circ\text{C to } +85^\circ\text{C}$			
			Min	Typ	Max	Min	Max	Min		Max	
t_{PLH} t_{PHL}	Propagation delay $I_0 - I_B \text{ to } \Sigma_E$	'F280A	Waveform 1, 2	5.0	7.0	9.0	5.0	10.0			ns
				7.5	10.0	13.0	7.5	14.5			
t_{PLH} t_{PHL}	Propagation delay $I_0 - I_B \text{ to } \Sigma_O$	'F280A	Waveform 1, 2	6.5	8.6	10.5	6.5	11.0			ns
				7.0	9.1	12.0	6.0	13.0			
t_{PLH} t_{PHL}	Propagation delay $I_0 - I_B \text{ to } \Sigma_E$	'F280B	Waveform 1, 2	4.0	6.5	9.0	3.5	10.0	3.0	11.0	ns
				4.0	7.0	10.0	3.5	11.1	3.5	12.0	
t_{PLH} t_{PHL}	Propagation delay $I_0 - I_B \text{ to } \Sigma_O$	'F280B	Waveform 1, 2	4.0	6.5	9.0	3.5	10.0	3.0	11.0	ns
				4.0	7.0	10.0	3.5	11.0	3.5	12.0	

AC WAVEFORMS



TEST CIRCUIT AND WAVEFORMS

