

10116B,F: -30 to +85°C

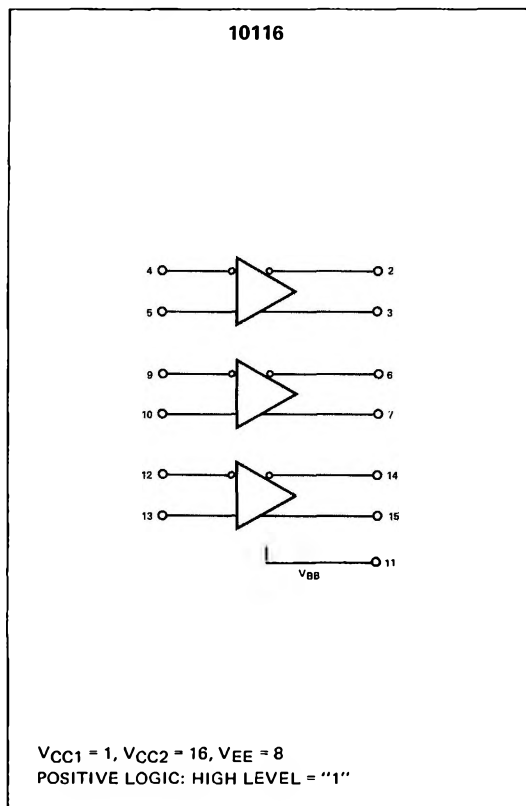
DIGITAL 10,000 SERIES ECL

DESCRIPTION

The 10116 is a triple differential amplifier designed for use in sensing differential signals over long lines. The base bias supply (V_{BB}) is made available at pin 11 to make the device useful as a Schmitt trigger, or in other applications where a stable reference voltage is necessary. Active current sources provide the 10116 with excellent common mode noise rejection. If any amplifier in a package is not used, one input of that amplifier must be connected to V_{BB} (pin 11) to prevent upsetting the current source bias network.

Complementary outputs are provided to allow driving twisted pair lines, to enable cascading of several amplifiers in a chain, or simply to provide complemented outputs of the input logic function.

LOGIC DIAGRAM



FEATURES

- GOOD COMMON MODE NOISE REJECTION
- FAST PROPAGATION DELAY = 2.0 ns TYP
- LOW POWER DISSIPATION = 83 mW/PACKAGE TYP (NO LOAD)
- HIGH FANOUT CAPABILITY
— CAN DRIVE 50 Ω LINES
- VERY HIGH INPUT Z — NO 50 K PULLDOWNS
- HIGH IMMUNITY FROM POWER SUPPLY VARIATIONS: $V_{EE} = -5.2 V \pm 5\%$ RECOMMENDED
- COMPLEMENTARY OUTPUTS
- OPEN EMITTER LOGIC AND BUSSING CAPABILITY
- V_{BB} VOLTAGE AVAILABLE ON PIN 11

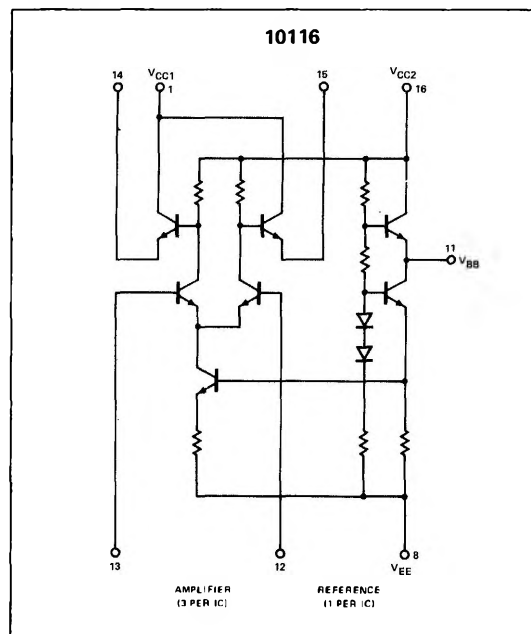
TEMPERATURE RANGE

- -30 to +85°C Operating Ambient

PACKAGE TYPE

- B: 16-Pin Silicone DIP
- F: 16-Pin CERDIP

CIRCUIT SCHEMATIC



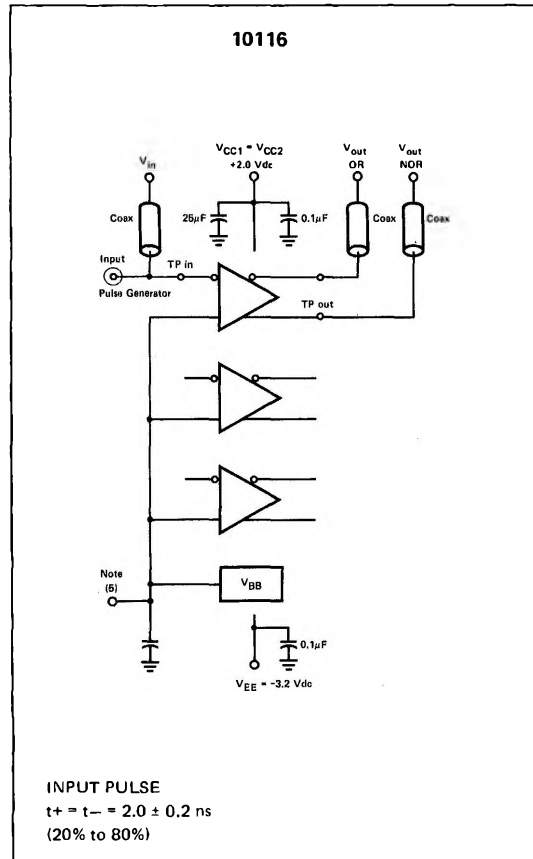
ELECTRICAL CHARACTERISTICS

(At Listed Voltages and Ambient Temperatures).

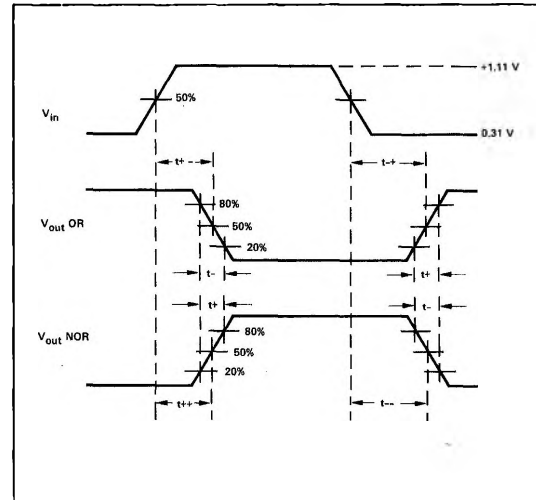
Characteristic	Symbol	Pin Under Test	10116 Test Limits						Unit	TEST VOLTAGE VALUES						(V _{CC}) Gnd	
			-30°C		+25°C		+85°C			[Volts]							
			Min	Max	Min	Typ	Max	Min		Max	V _{IH} max	V _{IL} min	V _{IHA} min	V _{IHA} max	V _{BB}		V _{EE}
Power Supply Drain Current	I _E	8	—	—	—	18	20	—	—	mAdc	—	4.9, 12	—	—	From Pin	-5.2	
	I _{inH}	4	—	—	—	95	—	—	—	μAdc	4	9, 12	—	—	Pin	-5.2	
	I _{CBO}	4	—	—	—	1.0	—	—	—	μAdc	—	9, 12	—	—	11	-5.2	
High Output Voltage	V _{OH}	2	-1.060	-0.860	-0.960	—	-0.810	-0.890	-0.700	V _{dc}	4	9, 12	—	—	5, 10, 13	8	1, 16
		3	-1.060	-0.890	-0.980	—	-0.810	-0.890	-0.700	V _{dc}	9, 12	4	—	—	5, 10, 13	8	1, 16
Low Output Voltage	V _{OL}	2	-1.890	-1.675	-1.860	—	-1.860	-1.825	-1.615	V _{dc}	9, 12	4	—	—	5, 10, 13	8	1, 16
		3	-1.890	-1.675	-1.860	—	-1.860	-1.825	-1.615	V _{dc}	4	9, 12	—	—	5, 10, 13	8	1, 16
High Threshold Voltage	V _{OHA}	2	-1.080	—	-0.980	—	-0.910	—	—	V _{dc}	—	9, 12	4	—	5, 10, 13	8	1, 16
		3	-1.080	—	-0.980	—	-0.910	—	—	V _{dc}	9, 12	—	4	—	5, 10, 13	8	1, 16
Low Threshold Voltage	V _{OLA}	2	—	-1.865	—	—	-1.830	—	-1.695	V _{dc}	—	9, 12	—	4	5, 10, 13	8	1, 16
		3	—	-1.865	—	—	-1.830	—	-1.695	V _{dc}	9, 12	—	4	—	5, 10, 13	8	1, 16
Reference Voltage	V _{BB}	11	-1.420	-1.280	-1.350	—	-1.230	-1.295	-1.160	V _{dc}	—	—	—	—	5, 10, 13	8	1, 16
Switching Times (50-ohm load)																	
Propagation Delay	t _{4+ 2+}	2	1.0	3.1	1.0	2.0	2.9	1.0	3.3	ns	—	—	4	2	5, 10, 13	8	1, 16
	t _{4- 2-}	2	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
	t _{4+ 3-}	3	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
	t _{4- 3+}	3	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
Rise Time (20% to 80%)	t ₂₊	2	1.1	3.6	1.1	2.0	3.3	1.1	3.7	—	—	—	—	—	—	—	—
	t ₃₊	3	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
Fall Time (20% to 80%)	t ₂₋	2	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—
	t ₃₋	3	↓	↓	↓	↓	↓	↓	↓	—	—	—	—	—	—	—	—

* Unused outputs connected to a 50-ohm resistor to ground.

SWITCHING TIME TEST CIRCUIT



PROPAGATION DELAY WAVEFORMS @ 25°C



NOTES:

- Each ECL 10,000 series device has been designed to meet the DC specifications shown in the test table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 linear fpm is maintained. Voltage levels will shift approximately 3 mV with an air flow of 200 linear fpm. Outputs are terminated through a 50-ohm resistor to 2.0 volts.
- For AC tests, all input and output cables to the scope are equal lengths of 50-ohm coaxial cable. Wire length should be < 1/4 inch from TP_{in} to input pin and TP_{out} to output pin. A 50-ohm termination to ground is located in each scope input. Unused outputs are connected to a 50-ohm resistor to ground.
- Test procedures are shown for only one input or set of input conditions. Other inputs are tested in the same manner.
- All voltage measurements are referenced to the ground terminal. Terminals not specifically referenced are left electrically open.
- One input from each gate must be tied to V_{BB} (Pin 11) during testing.