

10172F: -30 to +85°C, CERDIP

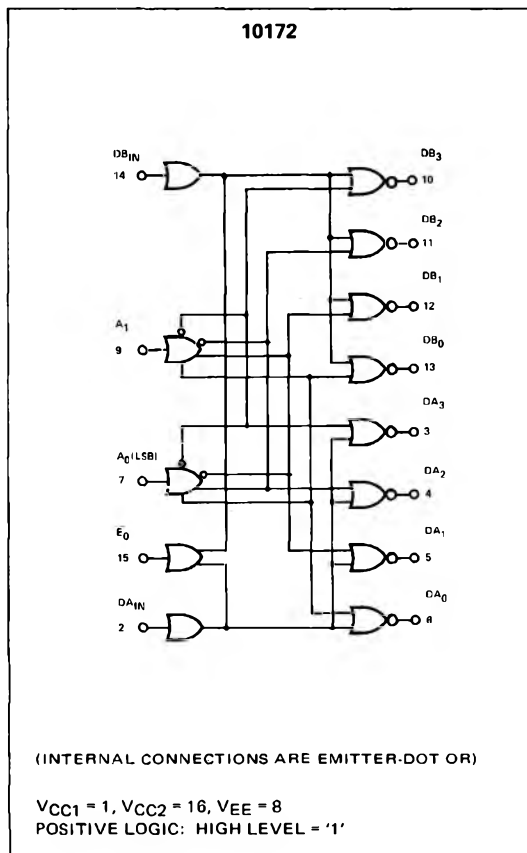
DIGITAL 10,000 SERIES ECL

DESCRIPTION

The 10172 is a binary coded 2 line to 4 line decoder/demultiplexer. Outputs are normally low with the selected outputs going high. The enable input when high forces all eight outputs low. Each data input when low forces its four outputs low. Hence, when using as a decoder the data inputs should be connected to a logic "1" level. Data paths are non-inverting.

The 10172 is a true parallel decoder using internal emitter dotting techniques. Hence it eliminates unequal delay times found in other decoders. The 10172 is a low power, high speed device with high Z input pulldown resistors and open emitter outputs.

LOGIC DIAGRAM



FEATURES

- **FAST PROPAGATION DELAY**
= 4.0 ns TYP ADDRESS TO OUTPUT
= 4.5 ns TYP ENABLE OR DATA TO OUTPUT
- **LOW POWER DISSIPATION** = 310 mW/PACKAGE TYP (NO LOAD)
- **HIGH FANOUT CAPABILITY** - CAN DRIVE EIGHT 50 Ω LINES
- **TRUE PARALLEL DECODER** - ELIMINATES UNEQUAL DELAY TIMES
- **HIGH IMMUNITY FROM POWER SUPPLY VARIATIONS:** VEE = -5.2 V ±5% RECOMMENDED
- **HIGH Z INPUTS** - INTERNAL 50 kΩ PULLDOWNS
- **OPEN EMITTER OUTPUTS**
- **MEETS ECL 10,000 SERIES STANDARD INTERFACE SPECIFICATIONS**

APPLICATIONS

- Dual 1 line to 4 line Demultiplexer
- Crossbar Switch Applications
- High Fanout 1 of 4 Decoder
- Memory Chip Select Decoding

TRUTH TABLE

INPUTS				OUTPUTS			
E0	A1	A0	DA IN	DA0	DA1	DA2	DA3
L	L	L	H	H	L	L	L
L	L	L	L	L	L	L	L
L	L	H	H	L	H	L	L
L	L	H	L	L	L	L	L
L	H	L	H	L	L	H	L
L	H	L	L	L	L	L	L
L	H	H	H	L	L	L	H
L	H	H	L	L	L	L	L
H	φ	φ	φ	L	L	L	L

DB is Similar. φ = Don't Care

TEMPERATURE RANGE

- -30 to +85°C Operating Ambient

PACKAGE TYPE

- F: 16-Pin CERDIP

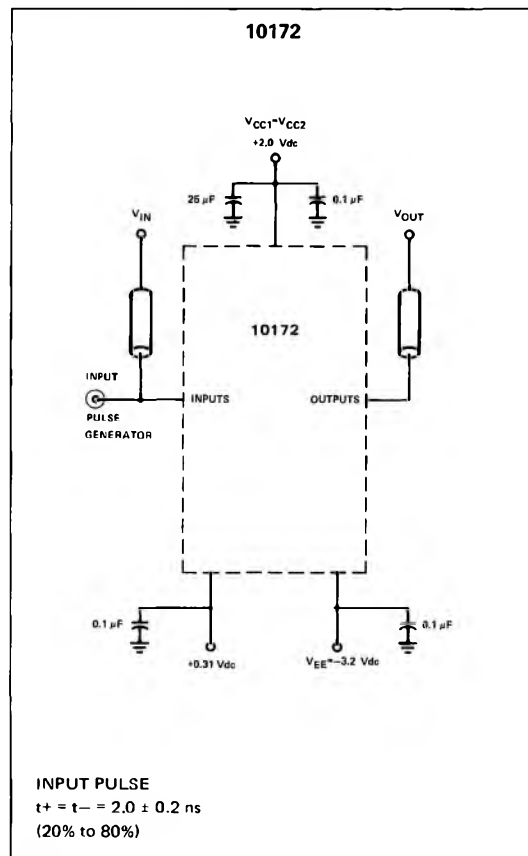
ELECTRICAL CHARACTERISTICS

(at Listed Voltages and Ambient Temperatures).

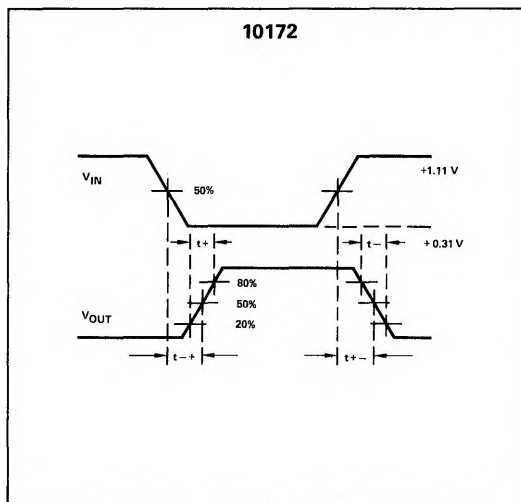
Characteristic	Symbol	Pin Under Test	10172 Test Limits										TEST VOLTAGE VALUES					Unit	V _{CC1} Gnd
			-30°C		+26°C		+85°C		[Volts]										
			Min	Max	Min	Max	Min	Max	Temperature	V _{IH} max	V _{IL} min	V _{IHA} min	V _{IHA} max	V _{EE}					
Power Supply Drain Current	I _E	8	—	—	—	60	75	—	—	mAdc	—	—	—	—	8	1,16			
Input Current	I _{inH}	14	—	—	—	—	265	—	—	μAdc	14	—	—	—	8	1,16			
	I _{inL}	14	—	—	0.6	—	—	—	—	μAdc	—	14	—	—	8	1,16			
Logic "1" Output Voltage	V _{OH}	13	-0.60	-0.890	-0.960	—	-0.810	-0.890	-0.700	Vdc	14	—	—	—	8	1,16			
Logic "0" Output Voltage	V _{OL}	13	-1.890	-1.675	-1.860	—	-1.660	-1.825	-1.615	Vdc	—	—	—	—	8	1,16			
Logic "1" Threshold Voltage	V _{OHA}	13	-1.080	—	-0.980	—	—	-0.910	—	Vdc	—	—	14	—	8	1,16			
Logic "0" Threshold Voltage	V _{OLA}	13	—	-1.655	—	—	-1.630	—	-1.695	Vdc	—	—	—	14	8	1,16			
Switching Times * (50 ohm load)																			
Propagation Delay	t _{g+13-}	13	—	—	—	4.0	—	—	—	ns	—	—	9	13	8	1,16			
	t _{g-13+}	13	—	—	—	4.0	—	—	—		—	—	—	—	8	1,16			
	t _r	13	—	—	—	2.0	—	—	—		—	—	—	—	—	—			
	t _f	13	—	—	—	2.0	—	—	—		—	—	—	—	—	—			

*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 fpm is maintained. Voltage levels will shift approximately 5 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.