

54F30244 Line Driver

Octal High Current Buffer/Line &
Backplane Driver, NINV (30 Ω O.C.)

Military Logic Products

Product Specification

DESCRIPTION

This device is a high current Open-Collector Octal Buffer composed of eight non-inverting drivers.

This device has non-inverting paths with two Output Enables ($\overline{OE}_0, \overline{OE}_1$) each controlling four outputs.

The driver is designed to deal with the low impedance transmission line effects found on printed circuit boards when fast edge rates are used.

The 130mA IOL provides ample power to achieve TTL switching on the incident wave voltage.

FEATURES

- Ideal for driving transmission lines or backplanes. 130mA I_{OL} ideal for low-impedance applications with impedance as low as 30Ω.
- High-impedance NPN base inputs for reduced loading (20μA in High and Low states)
- Ideal for applications which require high output drive and minimal bus loading
- "Flow through" pinout
- Open-Collector outputs sink 130mA
- Multiple side pins are used for V_{CC} and GND to reduce lead inductance (improves speed and noise immunity)
- 24-pin Silm DIP package

ORDERING INFORMATION

DESCRIPTION	ORDER CODE
24-Pin Ceramic DIP	54F30244/BLA
24-Pin Ceramic Flatpack	54F30244/BKA
28-Pin Ceramic LLCC	54F30244/B3A

FUNCTION TABLE

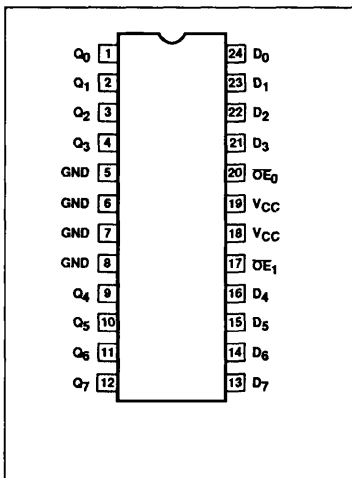
INPUTS		OUTPUTS
\overline{OE}_R	D_R	Q_R
L	L	L
L	H	H
H	X	OFF

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

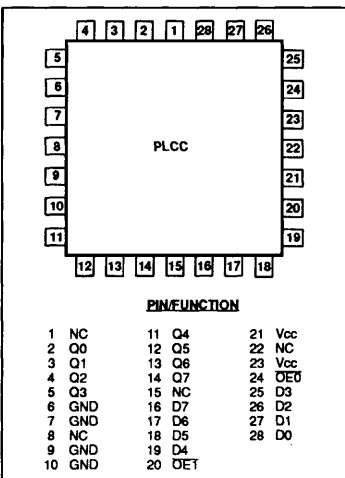
PINS	DESCRIPTION	54F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
$D_0 - D_7$	Data Inputs	1.0/0.033	20μA/20μA
$\overline{OE}_0, \overline{OE}_1$	Output Enable Inputs, (Active Low)	1.0/0.033	20μA/20μA
$Q_0 - Q_7$	Data Outputs	OC*/216.7	OC*/130mA

NOTE: One (1.0) FAST Unit Load (U.L.) is defined as: 20μA in the High state and 0.6mA in the Low state. OC* = Open Collector

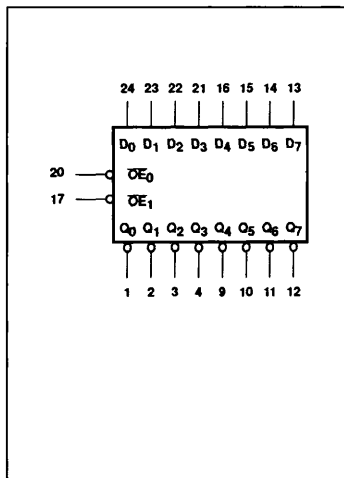
PIN CONFIGURATION



LLCC PIN CONFIGURATION



LOGIC SYMBOL



Line Driver

54F30244

ABSOLUTE MAXIMUM RATINGS (Operation beyond the limits set forth in this table may impair the useful life of the device. Unless otherwise noted these limits are over the operating free-air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage range	-0.5 to +7.0	V
V_I	Input voltage range	-0.5 to +7.0	V
I_I	Input current range	-30 to +5.0	mA
V_O	Voltage applied to output in High output state	-0.5 to + V_{CC}	V
I_O	Current applied to output in Low output state	260	mA
T_{STG}	Storage temperature range	-65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			UNIT
		Min	Nom	Max	
V_{CC}	Supply voltage	4.5	5.0	5.5	V
V_{IH}	High-level input voltage	2.0			V
V_{IL}	Low-level input voltage			0.8	V
I_{IK}	Input clamp current			-18	mA
V_{OH}	High-level output voltage			4.5	V
I_{OL}	Low-level output current			130	mA
T_A	Operating free-air temperature range	-55		+125	°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	
I_{OH}	High-level output current	$V_{CC} = \text{Min}, V_{IL} = \text{Max}, V_{IH} = \text{Min}, V_{OH} = \text{Max}$			250	μA
V_{OL}	Low-level output voltage	$V_{CC} = \text{Min}, V_{IL} = \text{Max}, V_{IH} = \text{Min}$	$I_{OL} = 100\text{mA}$.35	.50	V
			$I_{OL1} = 130\text{mA}^3$.35	.55	V
V_{IK}	Input clamp voltage	$V_{CC} = \text{Min}, I_I = I_{IK}$	-0.73	-1.2	V	
I_{IH2}	Input current at maximum input voltage	$V_{CC} = 0.0, V_I = 7.0\text{V}$			100	μA
I_{IH1}	High-level input current	$V_{CC} = \text{Max}, V_I = 2.7\text{V}$			20	μA
I_{IL}	Low-level input current	$V_{CC} = \text{Max}, V_I = 0.5\text{V}$			-20	μA
I_{CC}	Supply current (total)	$V_{CC} = \text{Max}$	I_{CCH}	19	27	mA
			I_{CCL}	70	100	mA

NOTES:

- For conditions shown as Min or Max, use the appropriate value specified under recommended operating conditions for the applicable type and function table for operating mode.
- All typical values are at $V_{CC} = 5\text{V}, T_A = 25^\circ\text{C}$.
- I_{OL1} is the current necessary to guarantee the High and Low transition in a 30Ω transmission line on the incident wave.

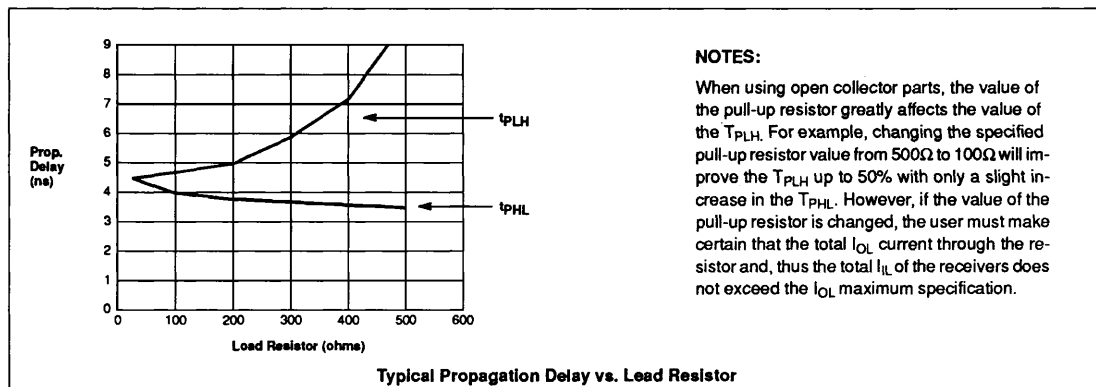
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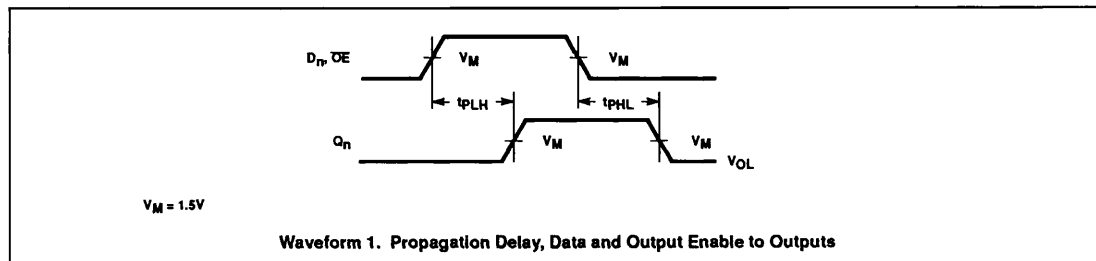
AC ELECTRICAL CHARACTERISTICS (When measured in accordance with the procedures outlined in Signetics LOGIC App Note 202, "Testing and Specifying FAST Logic.")

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS					UNIT
			T _A = +25°C			T _A = -55°C to +125°C		
			Min	Typ	Max	Min	Max	
t _{PLH} t _{PHL}	Propagation delay D _n to Q _n	Waveform 1	4.0	10.5	14.5	4.0	15.0	ns
t _{PLH} t _{PHL}	Propagation delay OE to Q _n	Waveform 1	3.0	5.5	9.0	3.0	9.5	ns
t _{PLH} t _{PHL}	Propagation delay OE to Q _n	Waveform 1	4.0	9.5	14.0	4.0	14.5	ns
t _{PLH} t _{PHL}	Propagation delay OE to Q _n	Waveform 1	3.5	6.0	9.0	3.5	10.5	ns

AC CHARACTERISTICS



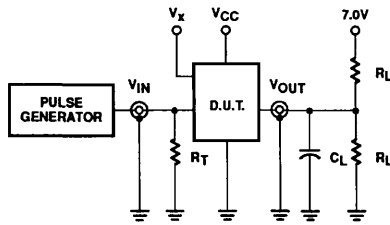
AC WAVEFORMS



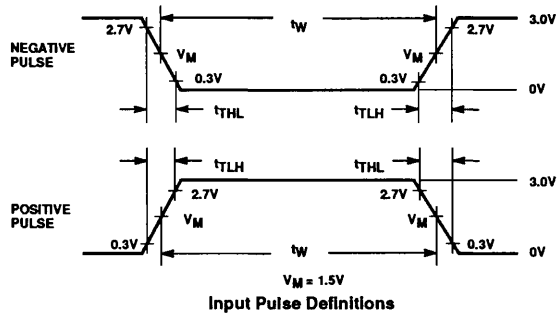
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TEST CIRCUIT AND WAVEFORMS



Test Circuit for 3-State Outputs and Open Collector Outputs



DEFINITIONS:

- R_L = Load Resistor; see AC Characteristics for value.
- C_L = Load capacitance includes jig and probe capacitance; see AC Characteristics for value.
- R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.
- V_X = Unclocked pins must be held at: $\leq 0.8V$, $\geq 2.7V$ or open per Function Table.

INPUT PULSE CHARACTERISTICS

Family	Rep. Rate	t_W	t_{TLH}	t_{THL}
54F	1MHz	500ns	$\leq 2.5ns$	$\leq 2.5ns$