ST26C32

QUAD RS-422, RS-423 CMOS Differential Line Receiver

...the analog plus company™

June 1997–3

FEATURES

- Pin-to-Pin Compatible with National DS26C32C
- Low Power CMOS Design
- Three-State Outputs with Enable Pin
- Meets the EIA RS-422 Requirements
- Low Propagation Delays
- High Speed

GENERAL DESCRIPTION

The ST26C32 is a CMOS quad differential line receiver designed to meet the standard RS-422, RS-423 requirements. The ST26C32 has an input sensitivity of 200mv over the common mode input voltage range of ±7V. To improve noise margin and output stability for slow changing input signal, special hysteresis is built in the ST26C32 circuit.

The ST26C32 is a high speed line receiver designed to operate with MFM / RLL controllers and hard disk drives as well as RS-422, and RS-423 differential applications. ST26C32 provides TTL compatible outputs to interface with standard 74LS and CMOS design environments. ST26C32 is suitable for low power 5V operation.

ORDERING INFORMATION

Part No.	Package	Operating Temperature Range
ST26C32CP16	16 Lead 300 Mil PDIP	0°C to +70°C
ST26C32CF16	16 Lead 150 Mil JEDEC SOIC	0°C to +70°C
ST26C32IP16	16 Lead 300 Mil PDIP	-40°C to +85°C
ST26C32IF16	16 Lead 150 Mil JEDEC SOIC	-40°C to +85°C

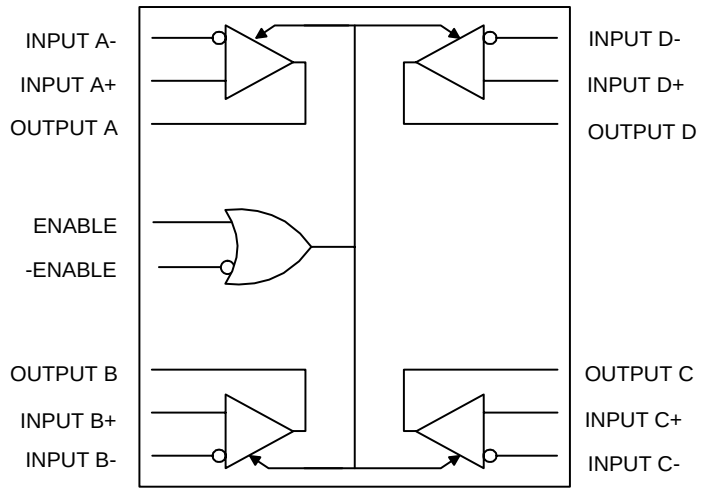

Figure 1. Block Diagram

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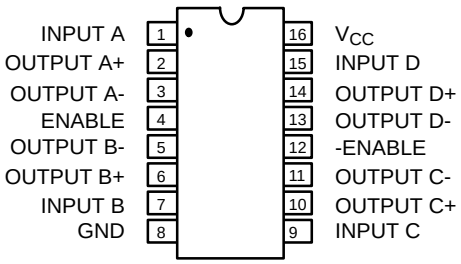
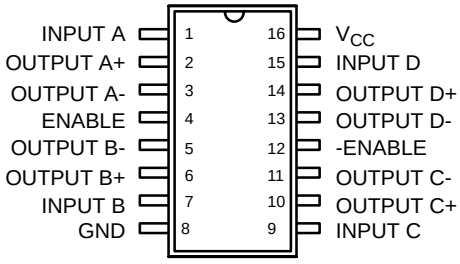
PIN CONFIGURATION



16 Lead PDIP (0.300")



16 Lead SOIC (Jedec, 0.150")

PIN DESCRIPTION

Pin #	Symbol	Type	Description
1	INPUT A-	I	Receiver A differential inverting input pin.
2	INPUT A+	I	Receiver A differential non-inverting input pin.
3	OUTPUT A	O	Receiver A output pin.
4	ENABLE	I	Gate control (active high). This pin is one of the two control pins which enables or disables all four receivers.
5	OUTPUT B	O	Receiver B output pin.
6	INPUT B+	I	Receiver B differential non-inverting input pin.
7	INPUT B-	I	Receiver B differential inverting input pin.
8	GND	O	Signal and power ground.
9	INPUT C-	I	Receiver C differential inverting input pin.
10	INPUT C+	I	Receiver C differential non-inverting input pin.
11	OUTPUT C	O	Receiver C output pin.
12	-ENABLE	I	Gate control (active low). See ENABLE description
13	OUTPUT D	O	Receiver D output pin.
14	INPUT D+	I	Receiver D differential non-inverting input pin.
15	INPUT D-	I	Receiver D differential inverting input pin.
16	V_{CC}	I	Power supply pin.

AC ELECTRICAL CHARACTERISTICS

Test Conditions: T_A = -40°C - +85°C, V_{CC} = 5.0V ± 10% unless otherwise specified.

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
T_1	Propagation Delay, Input to Output		8	10	ns	S1=V_{CC}
T_2	Propagation Delay, Input to Output		18	20	ns	S1=GND
T_3	Output Enable Time		18	20	ns	V_{DIF}=2.5V
T_4	Output Disable Time		18	20	ns	V_{DIF}=2.5V

DC ELECTRICAL CHARACTERISTICS

Test Conditions: T_A = -40°C - +85°C, V_{CC} = 5.0V ± 10% unless otherwise specified.

Symbol	Parameter	Min.	Typ.	Max.	Unit	Conditions
V_{IH}	Enable High Level	2.0			V	
V_{IL}	Enable Low Level			0.8	V	
V_{OH}	Output High Level	3.8	4.2		V	I_{OH}= -6mA
V_{OL}	Output Low Level			0.4	V	I_{OH}= 6mA
V_{ID}	Differential Input Level	-0.2		0.2	V	-7V < V_{CM} < +7V
V_H	Input Hysteresis		50		mV	
I_{IN}	Input Current			±1.0	µA	
I_{CC}	Operating Current		12		mA	V_{DIF}=+1V
I_{OZ}	Three-State Output Leakage		±1.0	±5.0	µA	V_{OUT}=V_{CC} or GND
I_{EN}	Enable Input Current		±1.0		µA	V_{IN}=V_{CC} or GND
V_R	Input Resistance	5		15	KΩ	-7V < V_{CM} < +7V

Specifications are subject to change without notice

ABSOLUTE MAXIMUM RATINGS

Supply Range 7V
Voltage at Any Pin . . . . . GND-0.3V to V_{CC} + 0.3V
Operating Temperature . . . . . –40°C to +85°C
Storage Temperature . . . . . -60°C to +160°C
Package Dissipation 500mW

Enable	-Enable	Input	Differential Non-Inverting Output	Differential Inverting Output
L	H	Z	X	X
H	L	L	L	H
H	L	H	H	L

Notes
X = Don't care
Z = Three-State (high impedance)

Table 1. Functional Table

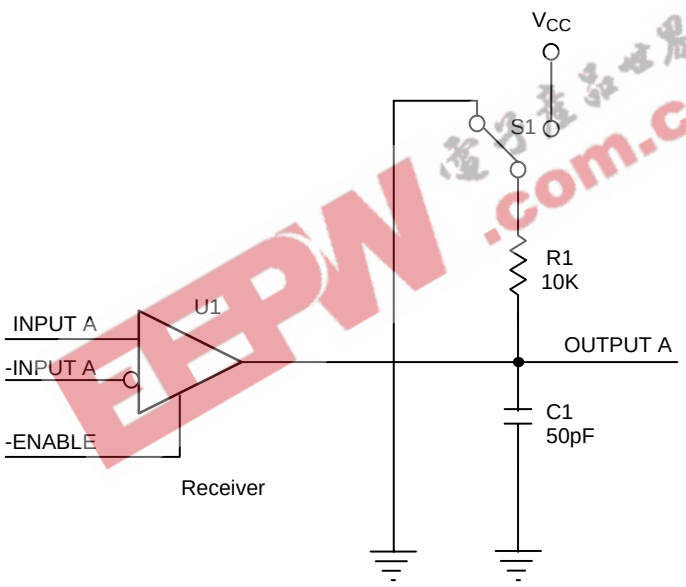


Figure 2. Test Condition

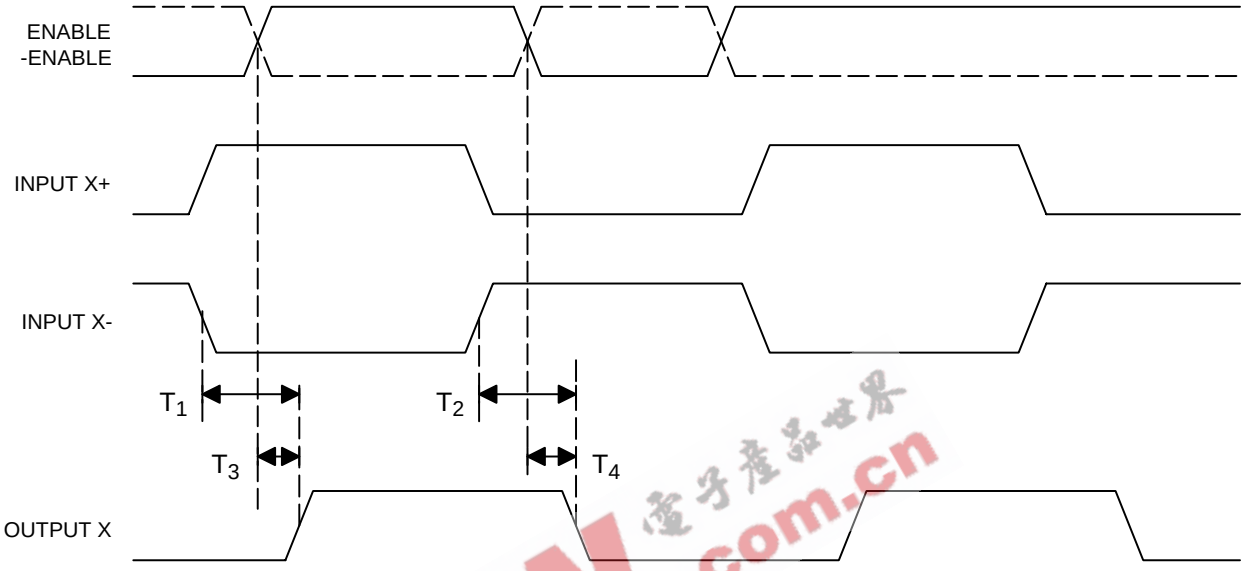
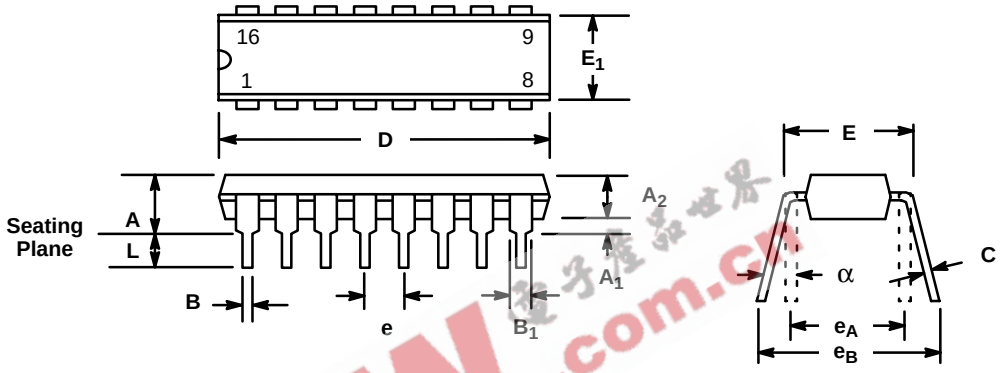


Figure 3. Differential Line Receiver Timing

16 LEAD PLASTIC DUAL-IN-LINE (300 MIL PDIP)

Rev. 1.00

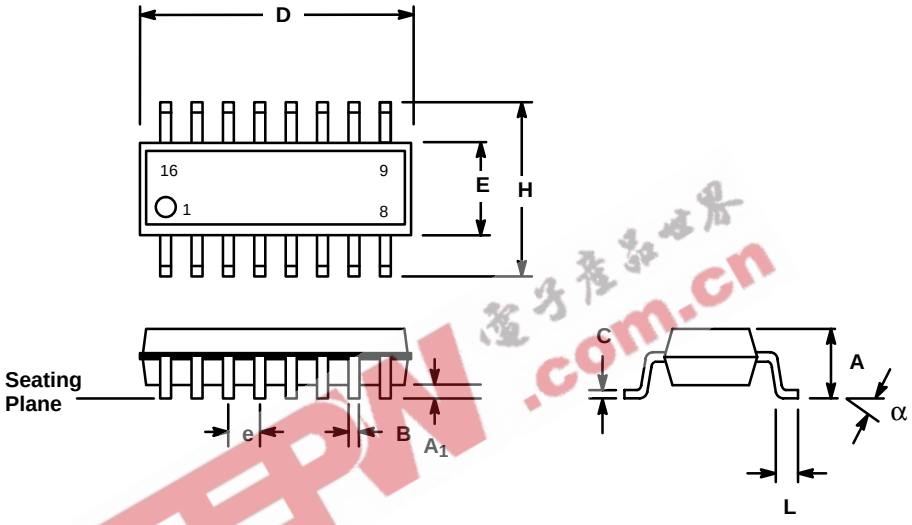


SYMBOL	INCHES MIN	INCHES MAX	MILLIMETERS MIN	MILLIMETERS MAX
A	0.145	0.210	3.68	5.33
A_1	0.015	0.070	0.38	1.78
A_2	0.115	0.195	2.92	4.95
B	0.014	0.024	0.36	0.56
B_1	0.030	0.070	0.76	1.78
C	0.008	0.014	0.20	0.38
D	0.745	0.840	18.92	21.34
E	0.300	0.325	7.62	8.26
E_1	0.240	0.280	6.10	7.11
e	0.100 BSC		2.54 BSC	
e_A	0.300 BSC		7.62 BSC	
e_B	0.310	0.430	7.87	10.92
L	0.115	0.160	2.92	4.06
α	0°	15°	0°	15°

Note: The control dimension is the inch column

16 LEAD SMALL OUTLINE
(150 MIL JEDEC SOIC)

Rev. 1.00



SYMBOL	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.053	0.069	1.35	1.75
A_1	0.004	0.010	0.10	0.25
B	0.013	0.020	0.33	0.51
C	0.007	0.010	0.19	0.25
D	0.386	0.394	9.80	10.00
E	0.150	0.157	3.80	4.00
e	0.050 BSC		1.27 BSC	
H	0.228	0.244	5.80	6.20
L	0.016	0.050	0.40	1.27
α	0°	8°	0°	8°

Note: The control dimension is the millimeter column

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