

Quad high speed differential line receiver

26LS33/26LS33A

FEATURES

- Input voltage range of 30 volts differential for 26LS33 and 25 volts differential for 26LS33A
- $\pm 0.5V$ sensitivity on 26LS33
- 6k minimum input impedance
- 60mV input hysteresis
- Operation from single +5V supply
- Fail safe input-output relationship. Output always high when inputs are open.
- 3-state drive, with choice of complementary output enables, for receiving directly onto a data bus
- 3-state outputs disabled during power up and power down

DESCRIPTION

The 26LS33/33A is a quad line receiver that provides an enable and disable function common to all four receivers. Both parts feature 3-State outputs with 8mA sink capability and incorporate a fail-safe input-output relationship which forces the outputs high when the inputs are open.

ORDERING INFORMATION

DESCRIPTION	ORDER CODE	PACKAGE DESIGNATOR*
16-Pin Ceramic DIP	26LS33/BEA 26LS33A/BEA	GDIP1-T16

* MIL-STD 1835 or Appendix A of 1995 Military Data Handbook

FUNCTION TABLE (EACH RECEIVER)

DIFFERENTIAL INPUT	ENABLES E	OUTPUT
$V_{ID} \geq V_{TH}$	H X	X L
$V_{TL} \leq V_{ID} \leq V_{TH}$	H X	? ?
$V_{ID} \leq V_{TL}$	X	L
X	L	H

H = High level

L = Low level

X = Irrelevant

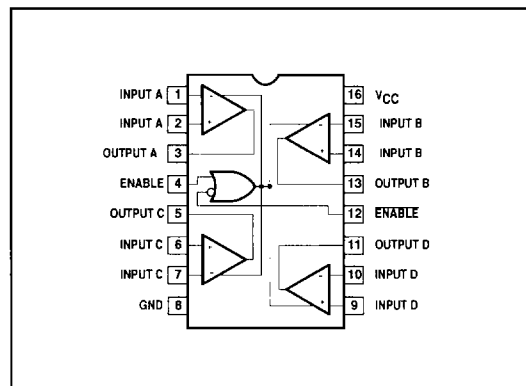
Z = High impedance (off)

? = Indeterminate

E = Enable

E = Enable

PIN CONFIGURATIONS

ABSOLUTE MAXIMUM RATINGS¹

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Power supply	7	V
V_{IN}	Input voltage	7	V
I_O	Output sink current	50	mA
V_{CMV}	Common mode range	± 25	V
V_{TH}	Differential input voltage	± 25	V
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
T_{amb}	Operating free-air temperature range	-55		+125	°C

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DC ELECTRICAL CHARACTERISTICS

(Over recommended operating temperature and supply voltage range unless otherwise specified.)

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS			UNIT
			MIN	TYP ¹	MAX	
V_{TH}	Differential input voltage	$-15V \leq V_{CM} \leq +15V$	-0.5	0.06	0.5	V
R_{IN}	Input resistance	$-15V \leq V_{CM} \leq +15V$, (One input AC ground)	6.0	9.8		k Ω
I_{IN}	Input current (under test)	$V_{IN} = +15V$ (26LS33A) Other input $-10V \leq V_{IN} \leq +15V$ (26LS33) Other input $-15V \leq V_{IN} \leq +15V$			2.3 2.3	mA mA
I_{IN}	Input current (under test)	$V_{IN} = -15V$ (26LS33A) Other input $-15V \leq V_{IN} \leq +10V$ (26LS33) Other input $-15V \leq V_{IN} \leq +15V$			-2.8 -2.8	mA mA
V_{OH}	Output High voltage	$V_{CC} = \text{Min}$, $I_{OH} = -440\mu A$ $\Delta V_{IN} = +1.0V$, $V_{ENABLE} = 0.8V$	2.5	3.4		V
V_{OL}	Output Low voltage	$V_{CC} = \text{Min}$, $V_{ENABLE} = 0.8V$, $\Delta V_{IN} = +1.0V$		0.3	0.4	V
		$I_{OL} = 4.0mA$ $I_{OL} = 8.0mA$			0.45	V
V_{IL}	Enable Low voltage				0.8	V
V_{IH}	Enable High voltage		2.0			V
V_I	Enable clamp voltage	$V_{CC} = \text{Min}$, $I_{IN} = -18mA$			-1.5	V
I_O	Off state (high impedance) output current	$V_{CC} = \text{Max}$			20	μA
		$V_O = 2.4V$ $V_O = 0.4V$			-20	μA
I_{IL}	Enable Low current	$V_{IN} = 0.4V$		-0.2	-0.36	mA
I_{IH}	Enable High current	$V_{IN} = 2.7V$		0.5	20	μA
I_I	Enable input High current	$V_{IN} = 5.5V$		1	100	μA
I_{SC}	Output short circuit current	$V_{CC} = \text{Max}$, $\Delta V_{IN} = +1V$, $V_{OUT} = 0V$	-15	-60	-85	mA
I_{CC}	Power supply current	$V_{CC} = \text{Max}$; All $V_{IN} = \text{GND}$, outputs disabled		52	70	mA
V_{HYST}	Input hysteresis	$T_{amb} = 25^\circ C$, $V_{CC} = 5.0V$, $V_{CM} = 0V$		120		mV

AC ELECTRICAL CHARACTERISTICS

 $T_{amb} = +25^\circ C$, $V_{CC} = 5.0V$

SYMBOL	PARAMETER	TEST CONDITIONS	26LS33 LIMITS			26LS33A LIMITS		UNIT
			MIN	TYP ¹	MAX	MIN	MAX	
t_{PLH}	Input to output	See switching test circuit and waveforms. $C_L = 15pF$		9	25		35	ns
t_{PHL}	Input to output	See switching test circuit and waveforms. $C_L = 15pF$		10	25		35	ns
t_{LZ}	Enable to output	See switching test circuit and waveforms. $C_L = 5pF$		15	30		40	ns
t_{HZ}	Enable to output	See switching test circuit and waveforms. $C_L = 5pF$		12	22		30	ns
t_{ZL}	Enable to output	See switching test circuit and waveforms. $C_L = 15pF$		8	22		25	ns
t_{ZH}	Enable to output	See switching test circuit and waveforms. $C_L = 15pF$		8	22		25	ns

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AC ELECTRICAL CHARACTERISTICS

 $-55^{\circ}\text{C} \leq T_{\text{amb}} \leq +125^{\circ}\text{C}$, $V_{\text{CC}} = 5.0\text{V}$

SYMBOL	PARAMETER	TEST CONDITIONS	26LS33 LIMITS		26LS33A LIMITS		UNIT
			MIN	MAX	MIN	MAX	
t_{PLH}	Input to output	See switching test circuit and waveforms. $C_L = 15\text{pF}$		38		53	ns
t_{PHL}	Input to output	See switching test circuit and waveforms. $C_L = 15\text{pF}$		38		53	ns
t_{LZ}	Enable to output	See switching test circuit and waveforms. $C_L = 5\text{pF}$		45		60	ns
t_{HZ}	Enable to output	See switching test circuit and waveforms. $C_L = 5\text{pF}$		33		45	ns
t_{ZL}	Enable to output	See switching test circuit and waveforms. $C_L = 15\text{pF}$		33		38	ns
t_{ZH}	Enable to output	See switching test circuit and waveforms. $C_L = 15\text{pF}$		33		38	ns

NOTE:

1. All typical values are $T_A = 25^{\circ}\text{C}$, $V_{\text{CC}} = 5.0\text{V}$.