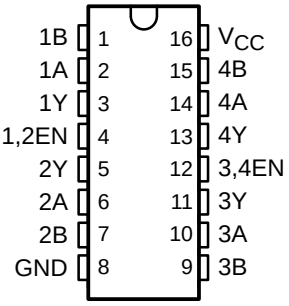
- **Meets or Exceeds the Requirements of ANSI Standards EIA/TIA-422-B and EIA/TIA-423-B and ITU Recommendations V.10 and V.11**
- **3-State, TTL-Compatible Outputs**
- **Fast Transition Times**
- **Operates From Single 5-V Supply**
- **Designed to Be Interchangeable With Motorola™ MC3486**

D, N, OR NS PACKAGE
(TOP VIEW)



description

The MC3486 is a monolithic quadruple differential line receiver designed to meet the specifications of ANSI Standards TIA/EIA-422-B and TIA/EIA-423-B and ITU Recommendations V.10 and V.11. The MC3486 offers four independent differential-input line receivers that have TTL-compatible outputs. The outputs utilize 3-state circuitry to provide a high-impedance state at any output when the appropriate output enable is at a low logic level.

The MC3486 is designed for optimum performance when used with the MC3487 quadruple differential line driver. It is supplied in a 16-pin package and operates from a single 5-V supply.

The MC3486 is characterized for operation from 0°C to 70°C.

AVAILABLE OPTIONS

T_A	PACKAGED DEVICES	
	PLASTIC SMALL OUTLINE (D, NS)	PLASTIC DIP (N)
0°C to 70°C	MC3486D MC3486NS	MC3486N

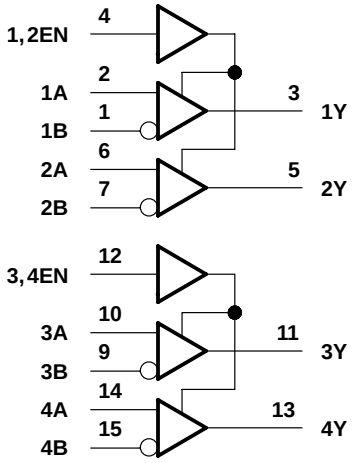
The D package is available taped and reeled. Add the suffix R to the device type (e.g., MC3486DR). The NS package is only available taped and reeled.

FUNCTION TABLE
(each receiver)

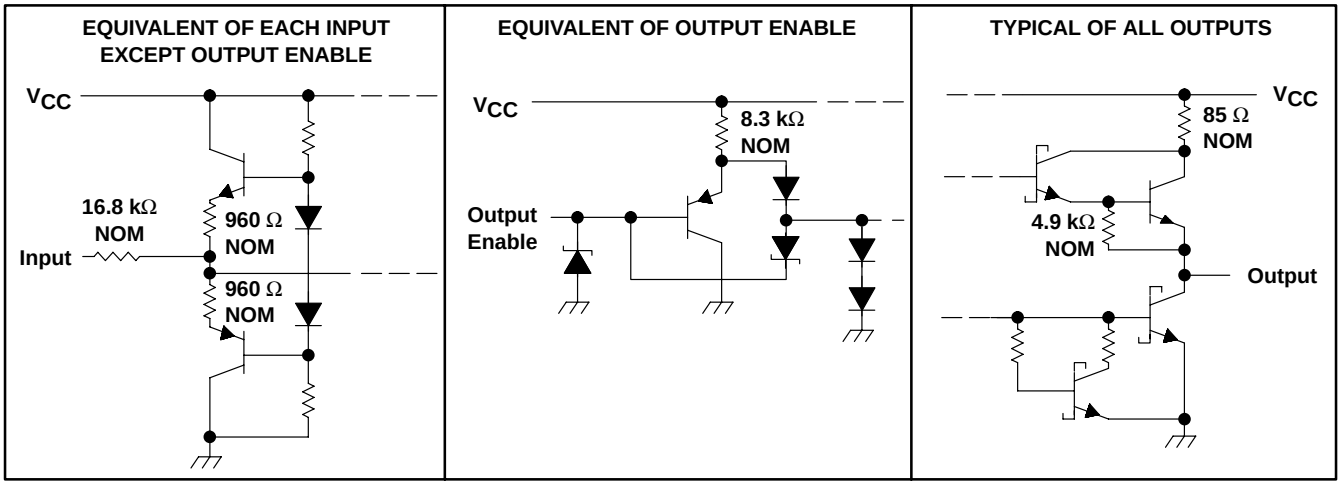
DIFFERENTIAL INPUTS A–B	ENABLE	OUTPUT Y
$V_{ID} \le 0.2$ V	H	H
-0.2 V $< V_{ID} < 0.2$ V	H	?
$V_{ID} \le -0.2$ V	H	L
Irrelevant	L	Z
Open	H	?

H = high level, L = low level, Z = high impedance (off),
? = indeterminate

logic diagram (positive logic)



schematics of inputs and outputs



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

Supply voltage, V_{CC} (see Note 1) . . . . . 8 V
Input voltage, V_I (A or B inputs) . . . . . ±15 V
Differential input voltage, V_{ID} (see Note 2) . . . . . ±25 V
Enable input voltage . . . . . 8 V
Low-level output current, I_{OL} . . . . . 50 mA
Package thermal impedance, θ_{JA} (see Note 3): D package . . . . . 73°C/W
N package . . . . . 67°C/W
NS package . . . . . 67°C/W
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds . . . . . 260°C
Storage temperature range, T_{stg} . . . . . –65°C to 150°C

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. All voltage values, except differential-input voltage, are with respect to network ground terminal.
2. Differential-input voltage is measured at the noninverting input with respect to the corresponding inverting input.
3. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	4.75	5	5.25	V
V_{IC}	Common-mode input voltage			±7	V
V_{ID}	Differential input voltage			±6	V
V_{IH}	High-level enable input voltage	2			V
V_{IL}	Low-level enable input voltage			0.8	V
T_A	Operating free-air temperature	0		70	°C

electrical characteristics over recommended ranges of common-mode input voltage, supply voltage, and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS			MIN	MAX	UNIT
V_{IT+}	Differential input high-threshold voltage	V_O = 2.7 V,	I_O = –0.4 mA			0.2	V
V_{IT-}	Differential input low-threshold voltage	V_O = 0.5 V,	I_O = –8 mA		–0.2†		V
V_{IK}	Enable-input clamp voltage	I_I = –10 mA				–1.5	V
V_{OH}	High-level output voltage	V_{ID} = 0.4 V, See Note 4 and Figure 1	I_O = –0.4 mA,		2.7		V
V_{OL}	Low-level output voltage	V_{ID} = –0.4 V, See Note 4 and Figure 1	I_O = 8 mA,			0.5	V
I_{OZ}	High-impedance-state output current	V_{IL} = 0.8 V,	V_{ID} = –3 V,	V_O = 2.7 V		40	μA
		V_{IL} = 0.8 V,	V_{ID} = 3 V,	V_O = 0.5 V		–40	
I_{IB}	Differential-input bias current	V_{CC} = 0 V or 5.25 V, Other inputs at 0 V		V_I = –10 V		–3.25	mA
				V_I = –3 V		–1.5	
				V_I = 3 V		1.5	
				V_I = 10 V		3.25	
I_{IH}	High-level enable input current	V_I = 5.25 V				100	μA
		V_I = 2.7 V				20	
I_{IL}	Low-level enable input current	V_I = –0.5 V				–100	μA
I_{OS}	Short-circuit output current	V_{ID} = 3 V,	V_O = 0,	See Note 5	–15	–100	mA
I_{CC}	Supply current	V_{IL} = 0				85	mA

† The algebraic convention, in which the least positive (most negative) limit is designated as minimum, is used in this data sheet for threshold voltages only.

NOTES: 4. Refer to ANSI Standards TIA/EIA-422-B and TIA/EIA-423-B for exact conditions.
5. Only one output should be shorted at a time.

switching characteristics, V_{CC} = 5 V, C_L = 15 pF, T_A = 25°C

PARAMETER		TEST CONDITIONS	MIN	TYP	MAX	UNIT
t_{PHL}	Propagation delay time, high- to low-level output	See Figure 2		28	35	ns
t_{PLH}	Propagation delay time, low- to high-level output			27	30	ns
t_{PZH}	Output enable time to high level	See Figure 3		13	30	ns
t_{PZL}	Output enable time to low level			20	30	ns
t_{PHZ}	Output disable time from high level			26	35	ns
t_{PLZ}	Output disable time from low level			27	35	ns

PARAMETER MEASUREMENT INFORMATION

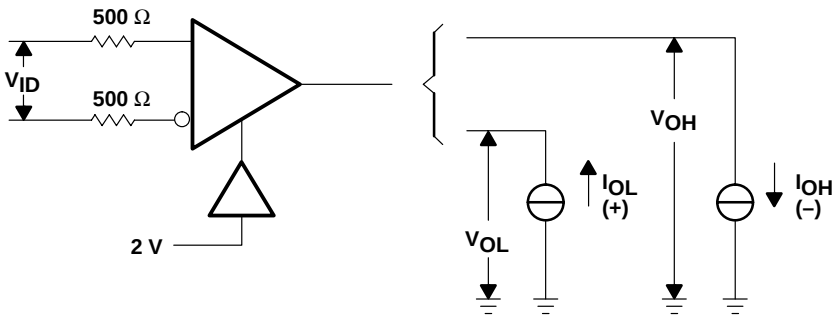
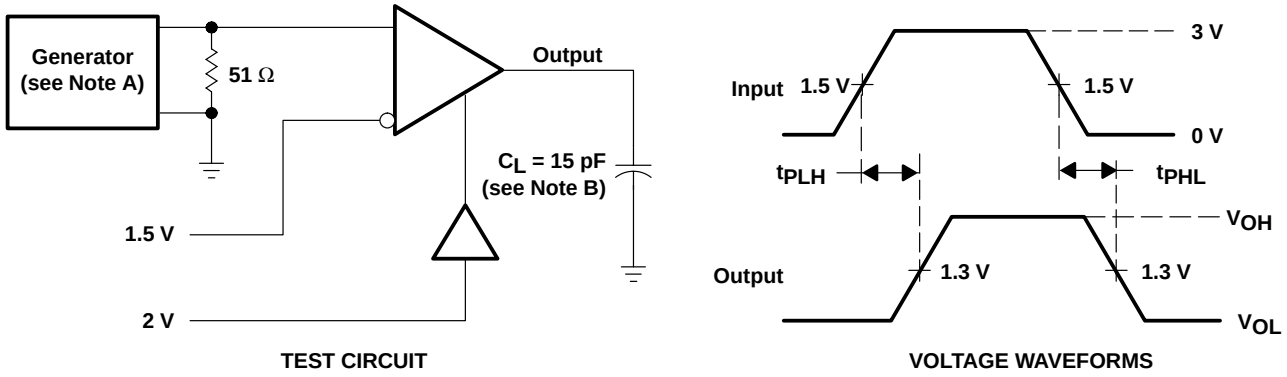


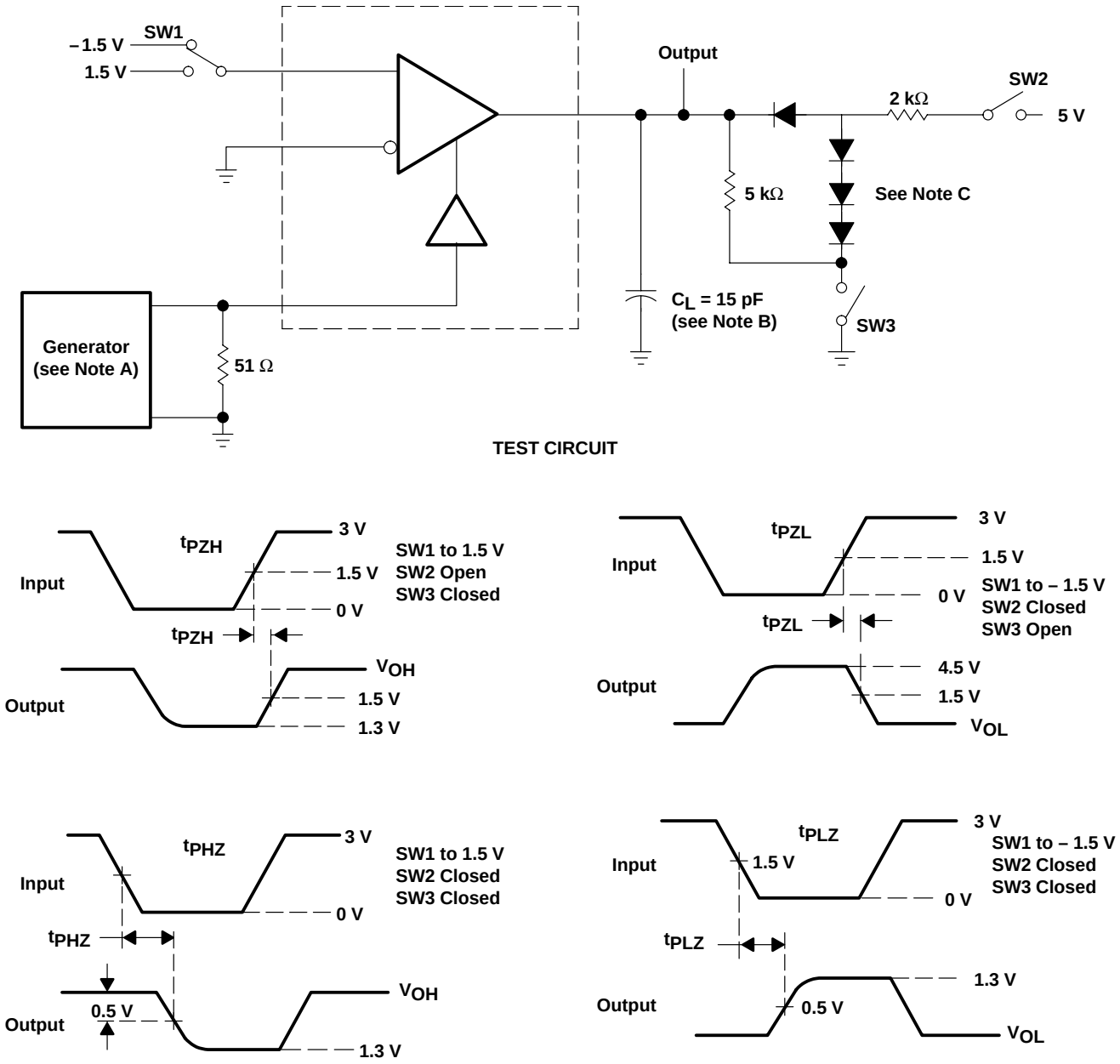
Figure 1. V_{OH}, V_{OL}



NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, duty cycle = 50%, t_r ≤ 6 ns, t_f ≤ 6 ns.
B. C_L includes probe and stray capacitance.

Figure 2. Test Circuit and Voltage Waveforms

PARAMETER MEASUREMENT INFORMATION



NOTES: A. The input pulse is supplied by a generator having the following characteristics: PRR ≤ 1 MHz, duty cycle = 50%, t_r ≤ 6 ns, t_f ≤ 6 ns.
B. C_L includes probe and stray capacitance.
C. All diodes are 1N916 or equivalent.

Figure 3. Test Circuit and Voltage Waveforms

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third–party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Mailing Address:

Texas Instruments
Post Office Box 655303
Dallas, Texas 75265