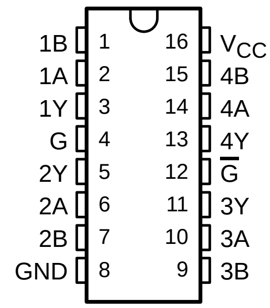
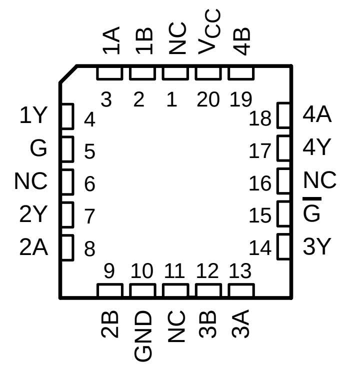
- **Meets or Exceeds the Requirements of ANSI TIA/EIA-422-B, TIA/EIA-423-B, and ITU Recommendation V.10 and V.11**
- **Low Power, I_{CC} = 10 mA Typ**
- **±7-V Common-Mode Range With ±200-mV Sensitivity**
- **Input Hysteresis . . . 60 mV Typ**
- **t_{pd} = 17 ns Typ**
- **Operates From a Single 5-V Supply**
- **3-State Outputs**
- **Input Fail-Safe Circuitry**
- **Improved Replacements for AM26LS32**
- **Available in Q-Temp Automotive**
  - **High Reliability Automotive Applications**
  - **Configuration Control/Print Support**
  - **Qualification to Automotive Standards**

AM26C32C, AM26C32I, AM26C32Q . . . D, N, OR NS PACKAGE
AM26C32M . . . J OR W PACKAGE
(TOP VIEW)



AM26C32M . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

description

The AM26C32 is a quadruple differential line receiver for balanced or unbalanced digital data transmission. The enable function is common to all four receivers and offers a choice of active-high or active-low input. The 3-state outputs permit connection directly to a bus-organized system. Fail-safe design specifies that if the inputs are open, the outputs are always high.

The AM26C32 devices are manufactured using a BiCMOS process, which is a combination of bipolar and CMOS transistors. This process provides the high voltage and current of bipolar with the low power of CMOS to reduce the power consumption to about one-fifth that of the standard AM26LS32, while maintaining ac and dc performance.

The AM26C32C is characterized for operation from 0°C to 70°C. The AM26C32I is characterized for operation from –40°C to 85°C. The AM26C32Q is characterized for operation from –40°C to 125°C. The AM26C32M is characterized for operation over the full military temperature range of –55°C to 125°C.

AVAILABLE OPTIONS

T_A	PACKAGED DEVICES				
	SMALL OUTLINE (D, NS)	PLASTIC DIP (N)	CERAMIC CHIP CARRIER (FK)	CERAMIC DIP (J)	CERAMIC FLATPACK (W)
0°C to 70°C	AM26C32CD AM26C32CNS	AM26C32CN —	—	—	—
–40°C to 85°C	AM26C32ID AM26C32INS	AM26C32IN —	—	—	—
–40°C to 125°C	AM26C32QD	AM26C32QN	—	—	—
–55°C to 125°C	—	—	AM26C32MFK	AM26C32MJ	AM26C32MW

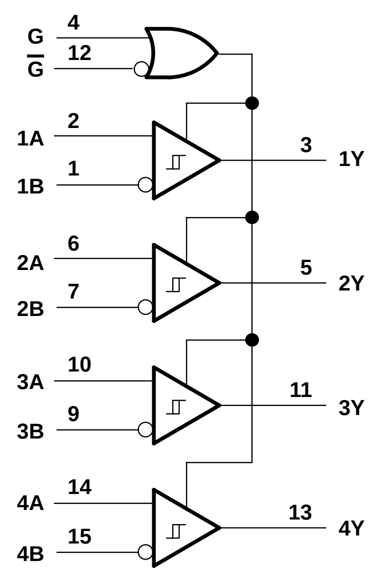
The D package is available taped and reeled. Add the suffix R to the device type (e.g., AM26C32CDR). The NS package is only available taped and reeled.

FUNCTION TABLE
(each receiver)

DIFFERENTIAL INPUT	ENABLES		OUTPUT Y
	G	$\overline{G}$	
$V_{ID} \geq V_{IT+}$	H	X	H
	X	L	H
$V_{IT-} < V_{ID} < V_{IT+}$	H	X	?
	X	L	?
$V_{ID} \leq V_{IT-}$	H	X	L
	X	L	L
X	L	H	Z

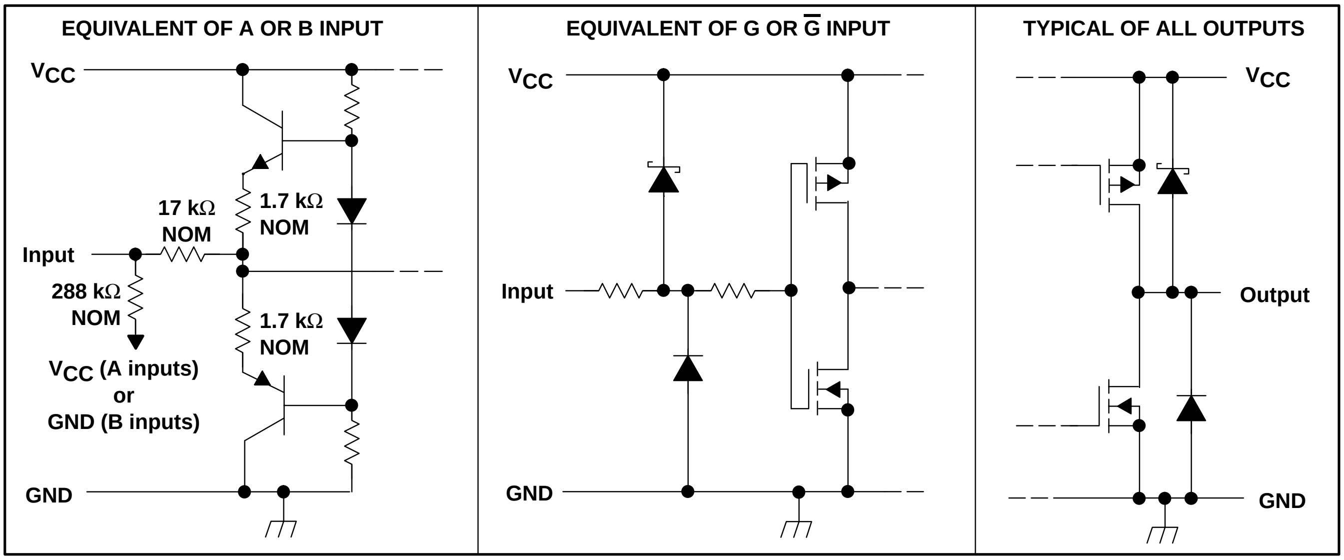
H = high level, L = low level, X = irrelevant
Z = high impedance (off), ? = indeterminate

logic diagram (positive logic)



Pin numbers shown are for the D, J, N, NS, and W packages.

schematics



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

Supply voltage, V_{CC} (see Note 1)		7 V
Input voltage range, V_I:	A or B inputs	–11 V to 14 V
	G or $\overline{G}$ inputs	–0.5 V to V_{CC} + 0.5 V
Differential input voltage range, V_{ID}		–14 V to 14 V
Output voltage range, V_O		–0.5 V to V_{CC} + 0.5 V
Output current, I_O		±25 mA
Package thermal impedance, θ_{JA} (see Notes 2 and 3):	D package	73°C/W
	N package	67°C/W
	NS package	64°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 output voltage, V_{OD}, are with respect to network GND. Currents into the device are positive and currents out of the device are negative.

2. Maximum power dissipation is a function of T_J(max), θ_{JA}, and T_A. The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(max) – T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.

3. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		4.5	5	5.5	V
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
V_{IC}	Common-mode input voltage				±7	V
I_{OH}	High-level output current				–6	mA
I_{OL}	Low-level output current				6	mA
T_A	Operating free-air temperature	AM26C32C	0		70	°C
		AM26C32I	–40		85	
		AM26C32Q	–40		125	
		AM26C32M	–55		125	

electrical characteristics over recommended ranges of V_{CC}, V_{IC}, and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IT+}	Differential input high-threshold voltage	$V_O = V_{OH}$(min), I_{OH} = –440 µA	V_{IC} = –7 V to 7 V			0.2	V
			V_{IC} = 0 to 5.5 V			0.1	
$V_{IT–}$	Differential input low-threshold voltage	V_O = 0.45 V, I_{OL} = 8 mA	V_{IC} = –7 V to 7 V	–0.2‡			V
			V_{IC} = 0 to 5.5 V	–0.1‡			
V_{hys}	Hysteresis voltage ($V_{IT+} – V_{IT–}$)				60		mV
V_{IK}	Enable input clamp voltage	V_{CC} = 4.5 V,	I_I = –18 mA			–1.5	V
V_{OH}	High-level output voltage	V_{ID} = 200 mV,	I_{OH} = –6 mA	3.8			V
V_{OL}	Low-level output voltage	V_{ID} = –200 mV,	I_{OL} = 6 mA		0.2	0.3	V
I_{OZ}	Off-state (high-impedance state) output current	$V_O = V_{CC}$ or GND			±0.5	±5	µA
I_I	Line input current	V_I = 10 V,	Other input at 0 V			1.5	mA
		V_I = –10 V,	Other input at 0 V			–2.5	
I_{IH}	High-level enable current	V_I = 2.7 V				20	µA
I_{IL}	Low-level enable current	V_I = 0.4 V				–100	µA
r_i	Input resistance	One input to ground		12	17		kΩ
I_{CC}	Supply current	V_{CC} = 5.5 V			10	15	mA

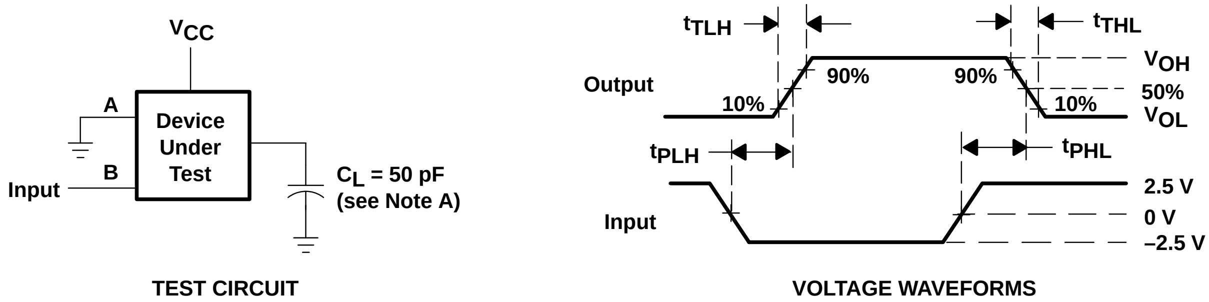
† All typical values are at V_{CC} = 5 V, V_{IC} = 0, and T_A = 25°C.
‡ The algebraic convention, in which the less positive (more negative) limit is designated minimum, is used in this data sheet for common-mode input voltage.

switching characteristics over recommended ranges of operation conditions, C_L = 50 pF (unless otherwise noted)

PARAMETER		TEST CONDITIONS	AM26C32C AM26C32I			AM26C32Q AM26C32M			UNIT
			MIN	TYP†	MAX	MIN	TYP†	MAX	
t_{PLH}	Propagation delay time, low- to high-level output	See Figure 1	9	17	27	9	17	27	ns
t_{PHL}	Propagation delay time, high- to low-level output		9	17	27	9	17	27	ns
t_{TLH}	Output transition time, low- to high-level output	See Figure 1		4	9		4	10	ns
t_{THL}	Output transition time, high- to low-level output			4	9		4	9	ns
t_{PZH}	Output enable time to high level	See Figure 2		13	22		13	22	ns
t_{PZL}	Output enable time to low level			13	22		13	22	ns
t_{PHZ}	Output disable time from high level	See Figure 2		13	22		13	26	ns
t_{PLZ}	Output disable time from low level			13	22		13	25	ns

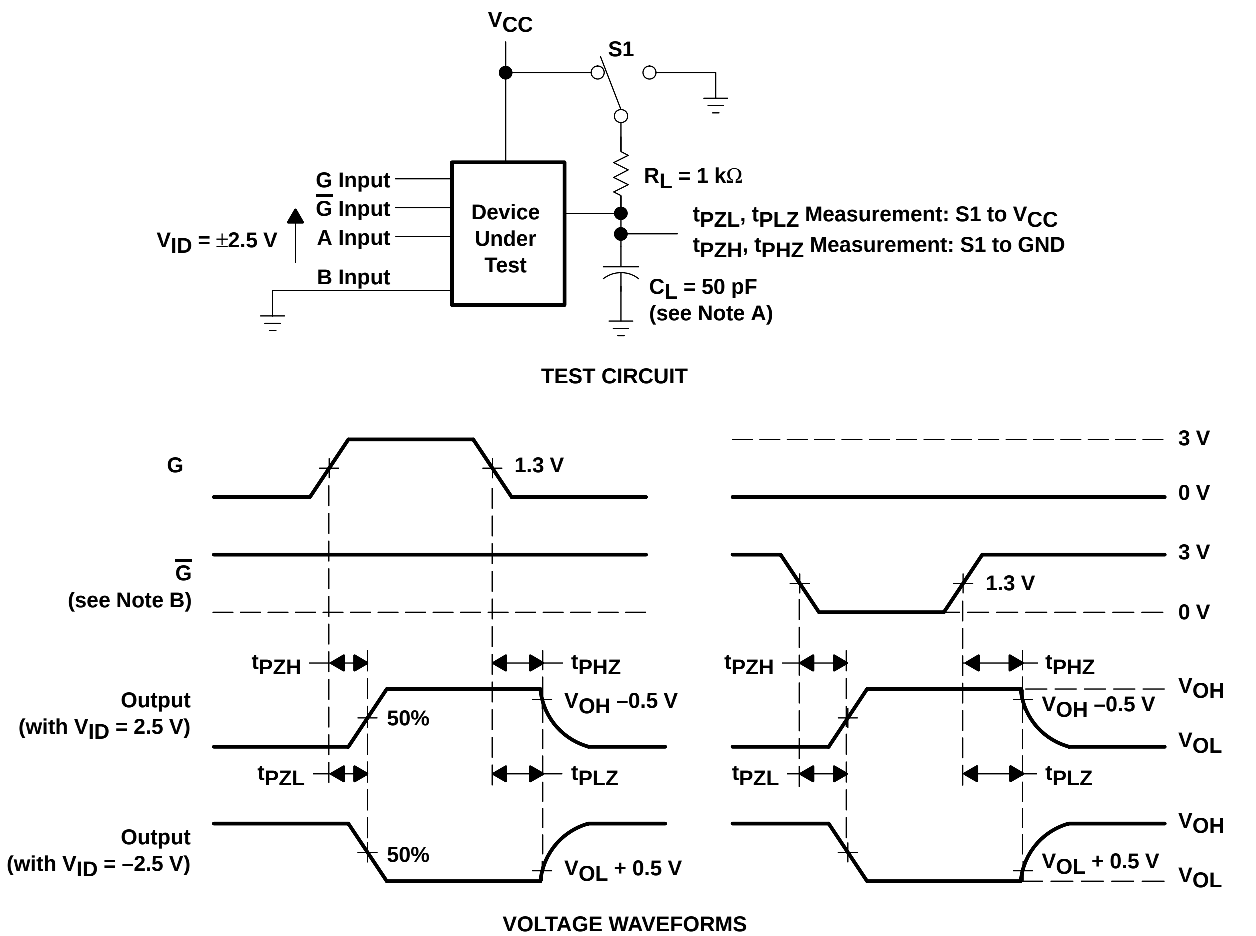
† All typical values are at V_{CC} = 5 V, T_A = 25°C.

PARAMETER MEASUREMENT INFORMATION



NOTE A: C_L includes probe and jig capacitance.

Figure 1. Switching Test Circuit and Voltage Waveforms



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

Figure 2. Enable/Disable Time Test Circuit and Output Voltage Waveforms

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