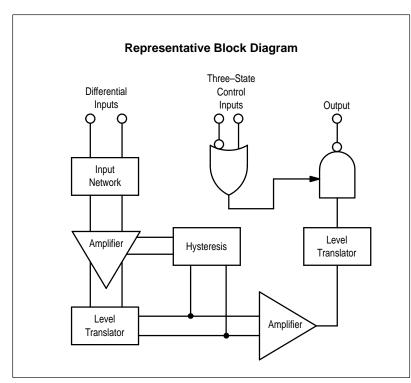


QUAD EIA-422/423 Line Receiver with Three-State Outputs

Motorola's Quad EIA–422/3 Receiver features four independent receiver chains which comply with EIA Standards for the Electrical Characteristics of Balanced/Unbalanced Voltage Digital Interface Circuits. Receiver outputs are 74LS compatible, three–state structures which are forced to a high impedance state when Pin 4 is a Logic "0" and Pin 12 is a Logic "1." A PNP device buffers each output control pin to assure minimum loading for either Logic "1" or Logic "0" inputs. In addition, each receiver chain has internal hysteresis circuitry to improve noise margin and discourage output instability for slowly changing input waveforms. A summary of AM26LS32 features include:

- Four Independent Receiver Chains
- Three-State Outputs
- High Impedance Output Control Inputs (PIA Compatible)
- Internal Hysteresis 30 mV (Typical) @ Zero Volts Common Mode
- Fast Propagation Times 25 ns (Typical)
- TTL Compatible
- Single 5.0 V Supply Voltage
- Fail–Safe Input–Output Relationship. Output Always High When Inputs Are Open, Terminated or Shorted
- 6.0 k Minimum Input Impedance



^{*} Note that the surface mount MC26LS32D device uses the same die as in the plastic DIP AM26LS32DC device, but with an MC prefix to prevent confusion with the package suffix.

AM26LS32

QUAD EIA-422/3 LINE RECEIVER WITH THREE-STATE OUTPUTS

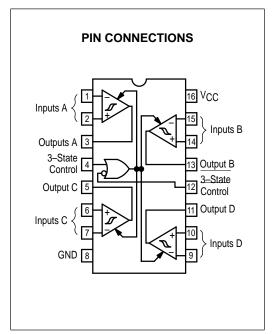
SEMICONDUCTOR TECHNICAL DATA

D SUFFIXPLASTIC PACKAGE
CASE 751B
(SO–16)





PC SUFFIX PLASTIC PACKAGE CASE 648



ORDERING INFORMATION

Device	Operating Temperature Range	Package	
AM26LS32PC	T _A = 0 to 70°C	Plastic DIP	
MC26LS32D*	1A = 0 10 70 C	SO-16	

AM26LS32

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Power Supply Voltage	VCC	7.0	Vdc
Input Common Mode Voltage	VICM	± 25	Vdc
Input Differential Voltage	V _{ID}	± 25	Vdc
Three-State Control Input Voltage	VI	7.0	Vdc
Output Sink Current	lo	50	mA
Storage Temperature	T _{stg}	- 65 to + 150	°C
Operating Junction Temperature	TJ	+ 150	°C

RECOMMENDED OPERATING CONDITIONS

Rating	Symbol	Value	Unit
Power Supply Voltage	Vcc	4.75 to 5.25	Vdc
Operating Ambient Temperature	T _A	0 to + 70	°C
Input Common Mode Voltage Range	VICR	- 7.0 to + 7.0	Vdc
Input Differential Voltage Range	VIDR	6.0	Vdc

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, minimum and maximum limits apply over recommended temperature and power supply voltage ranges. Typical values are for $T_A = 25^{\circ}C$, $V_{CC} = 5.0 \text{ V}$ and $V_{IC} = 0 \text{ V}$. See Note 1.)

Characteristic	Symbol	Min	Тур	Max	Unit
Input Voltage – High Logic State (Three–State Control)	VIH	2.0	-	-	V
Input Voltage – Low Logic State (Three–State Control)	VIL	-	-	0.8	V
Differential Input Threshold Voltage (Note 2) $ (-7.0 \text{ V} \leqslant \text{V}_{\text{IC}} \leqslant 7.0 \text{ V}, \text{V}_{\text{IH}} = 2.0 \text{ V}) \\ (\text{I}_{\text{O}} = -0.4 \text{ mA}, \text{V}_{\text{OH}} \geqslant 2.7 \text{ V}) \\ (\text{I}_{\text{O}} = 8.0 \text{ mA}, \text{V}_{\text{OL}} \leqslant 0.45 \text{ V}) $	VTH(D)	_ _ _	_ _ _	0.2 -0.2	V
Input Bias Current (V _{CC} = 0 V or 5.25) (Other Inputs at -15 V \leqslant V _{in} \leqslant +15 V) V _{in} = +15 V V _{in} = -15 V	I _{IB} (D)	_ _ _	_ _ _	2.3 -2.8	mA
Input Resistance ($-15 \text{ V} \leq \text{V}_{in} \leq +15 \text{ V}$)	R _{in}	6.0 K	-	-	Ohms
Input Balance and Output Level $ (-7.0 \text{ V} \leqslant \text{V}_{\text{IC}} \leqslant 7.0 \text{ V}, \text{V}_{\text{IH}} = 2.0 \text{ V}, \text{See Note 3}) $ $ (\text{I}_{\text{O}} = -0.4 \text{ mA}, \text{V}_{\text{ID}} = 0.4 \text{ V}) $ $ (\text{I}_{\text{O}} = 8.0 \text{ mA}, \text{V}_{\text{ID}} = -0.4 \text{ V}) $	VOH VOL	2.7	_ _	_ 0.45	V
Output Third State Leakage Current $(V_{I(D)} = + 3.0 \text{ V}, V_{IL} = 0.8 \text{ V}, V_{O} = 0.4 \text{ V})$ $(V_{I(D)} = -3.0 \text{ V}, V_{IL} = 0.8 \text{ V}, V_{O} = 2.4 \text{ V})$	I _{OZ}	_ _	- -	-20 20	μА
Output Short Circuit Current $(V_{I(D)} = 3.0 \text{ V}, V_{IH} = 2.0 \text{ V}, V_{O} = 0 \text{ V}, \text{ See Note 4})$	los	-15	-	-85	mA
Input Current – Low Logic State (Three–State Control) (V _{IL} = 0.4 V)	IIL	_	-	-360	μА
Input Current – High Logic State (Three–State Control) (VIH = 2.7 V) (VIH = 5.5 V)	lін	- -	- -	20 100	μА
Input Clamp Diode Voltage (Three–State Control) (I _{IC} = -18 mA)	VIK	_	-	-1.5	V
Power Supply Current (V _{IL} = 0 V) (All Inputs Grounded)	lcc	_	-	70	mA

NOTES: 1. All currents into device pins are shown as positive, out of device pins are negative. All voltages referenced to ground unless otherwise noted.

2. Differential input threshold voltage and guaranteed output levels are done simultaneously for worst case.

3. Refer to EIA-422/3 for exact conditions. Input balance and guaranteed output levels are done simultaneously for worst case.

4. Only one output at a time should be shorted.

SWITCHING CHARACTERISTICS ($V_{CC} = 5.0 \text{ V}$ and $T_A = 25^{\circ}\text{C}$, unless otherwise noted)

Characteristic	Symbol	Min	Тур	Max	Unit
Propagation Delay Time – Dlfferential Inputs to Output (Output High to Low) (Output Low to High)	tPHL(D)	- -	-	30 30	ns
Propagation Delay Time – Three–State Control to Output (Output Low to Third State) (Output High to Third State) (Output Third State to High) (Output Third State to Low)	[†] PLZ [†] PHZ [†] PZH [†] PZL	- - -		35 35 30 30	ns

Figure 1. Switching Test Circuit and Wave for Propagation Delay Differential Input to Output

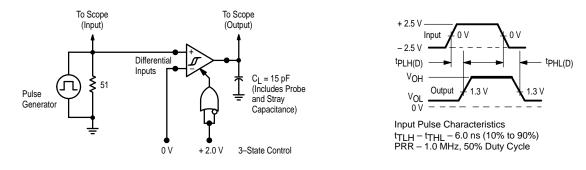
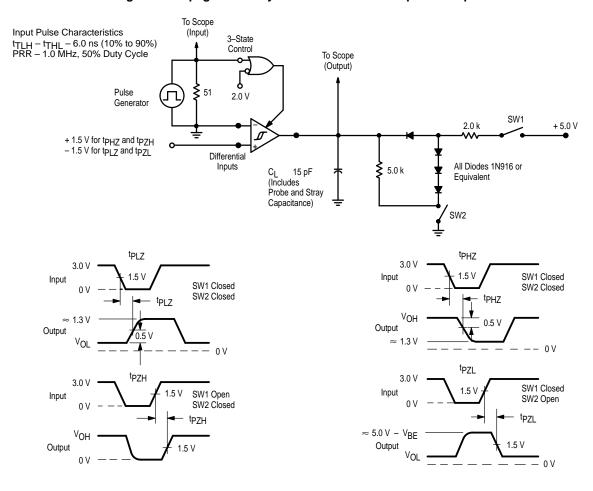
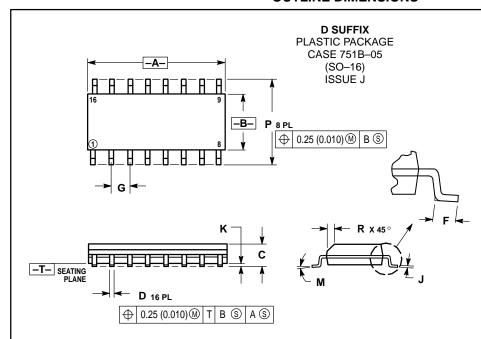


Figure 2. Propagation Delay Three-State Control Input to Output



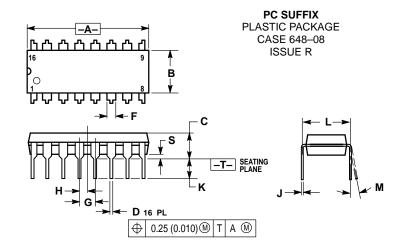
AM26LS32

OUTLINE DIMENSIONS



- DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
- CONTROLLING DIMENSION: MILLIMETER.
 DIMENSIONS A AND B DO NOT INCLUDE
- MOLD PROTRUSION.
 MAXIMUM MOLD PROTRUSION 0.15 (0.006)
- PER SIDE.
 DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
Α	9.80	10.00	0.386	0.393
В	3.80	4.00	0.150	0.157
С	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27	BSC	0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
М	0°	7°	0°	7°
Р	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019



NOTES

- DIMENSIONING AND TOLERANCING PER ANSI
- Y14.5M, 1982. CONTROLLING DIMENSION: INCH.
- DIMENSION L TO CENTER OF LEADS WHEN FORMED PARALLEL.
- DIMENSION B DOES NOT INCLUDE MOLD FLASH.
 ROUNDED CORNERS OPTIONAL.

	INCHES		MILLIMETERS		
DIM	MIN	MAX	MIN	MAX	
Α	0.740	0.770	18.80	19.55	
В	0.250	0.270	6.35	6.85	
С	0.145	0.175	3.69	4.44	
D	0.015	0.021	0.39	0.53	
F	0.040	0.70	1.02	1.77	
G	0.100	BSC	2.54 BSC		
Н	0.050	0.050 BSC		1.27 BSC	
J	0.008	0.015	0.21	0.38	
K	0.110	0.130	2.80	3.30	
L	0.295	0.305	7.50	7.74	
M	0°	10°	0°	10 °	
S	0.020	0.040	0.51	1.01	

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