



MOTOROLA

Order this document by MC26S10/D

## MC26S10

# Quad Open-Collector Bus Transceiver

This quad transceiver is designed to mate Schottky TTL or NMOS logic to a low impedance bus. The Enable and Driver inputs are PNP buffered to ensure low input loading. The Driver (Bus) output is open-collector and can sink up to 100 mA at 0.8 V, thus the bus can drive impedances as low as 100  $\Omega$ . The receiver output is active pull-up and can drive ten Schottky TTL loads.

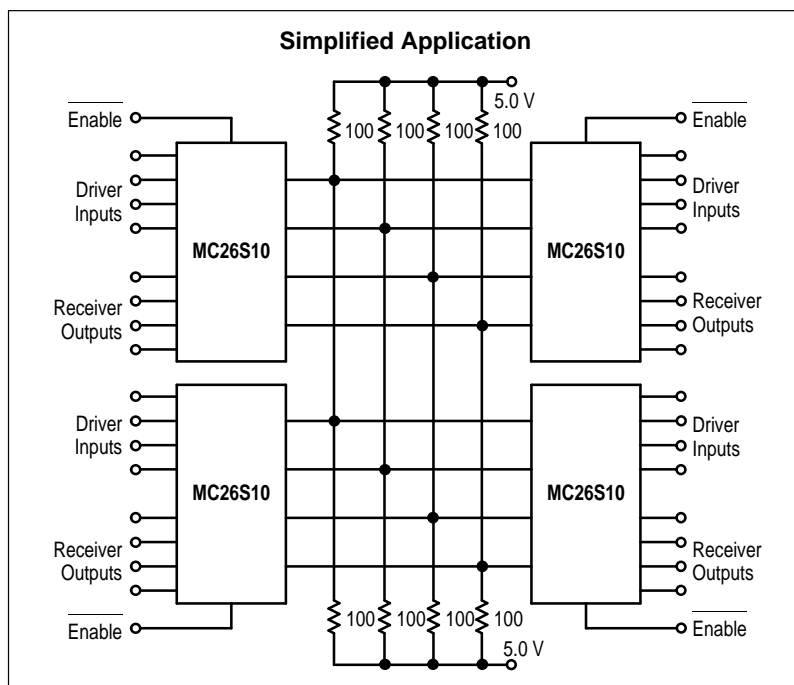
An active-low Enable controls all four drivers allowing the outputs of different device drivers to be connected together for party-line operation. The line can be terminated at both ends and still give considerable noise margin at the receiver. Typical receiver threshold is 2.0 V.

Advanced Schottky processing is utilized to assure fast propagation delay times. Two ground pins are provided to improve ground current handling and allow close decoupling between  $V_{CC}$  and ground at the package. Both ground pins should be tied to the ground bus external to the package.

- Driver Can Sink 100 mA at 0.8 V (Maximum)
- PNP Inputs for Low-Logic Loading
- Typical Driver Delay = 10 ns
- Typical Receiver Delay = 10 ns
- Schottky Processing for High Speed
- Inverting Driver

### ORDERING INFORMATION

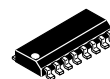
Device	Operating Temperature Range	Package
MC26S10P	$T_A = 0$ to $+70^\circ\text{C}$	Plastic DIP
MC26S10D		SO-16



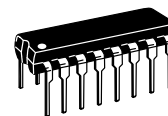
## QUAD OPEN-COLLECTOR BUS TRANSCEIVER

### SEMICONDUCTOR TECHNICAL DATA

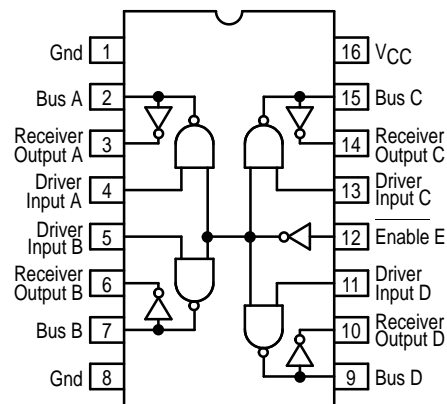
**D SUFFIX**  
PLASTIC PACKAGE  
CASE 751B  
(SO-16)



**P SUFFIX**  
PLASTIC PACKAGE  
CASE 648



### PIN CONNECTIONS



### TRUTH TABLE

Enable	Driver Input	Bus	Receiver Output
L	L	H	L
L	H	L	H
H	X	Y	Y

L = Low Logic State  
H = High Logic State  
X = Irrelevant  
Y = Assumes condition controlled by other elements on the bus

# MC26S10

## MAXIMUM RATINGS (T<sub>A</sub> = 25°C, unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V <sub>CC</sub>	–0.5 to +7.0	Vdc
Input Voltage	V <sub>I</sub>	–0.5 to +5.5	Vdc
Input Current	I <sub>I</sub>	–3.0 to +5.0	mA
Output Voltage – High Impedance State	V <sub>O</sub> (Hi–z)	–0.5 to V <sub>CC</sub>	V
Output Current – Bus	I <sub>O</sub> (B)	200	mA
Output Current – Receiver	I <sub>O</sub> (R)	30	mA
Operating Ambient Temperature	T <sub>A</sub>	0 to +70	°C
Storage Temperature	T <sub>stg</sub>	–65 to +150	°C
Junction Temperature	T <sub>J</sub>	150	°C

## ELECTRICAL CHARACTERISTICS (Unless otherwise noted V<sub>CC</sub> = 4.75 to 5.25 V and T<sub>A</sub> = 0 to +70°C. Typical values measured at V<sub>CC</sub> = 5.0 V and T<sub>A</sub> = 25°C.)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Voltage – Low Logic State (Driver and Enable Inputs)	V <sub>IL</sub>	–	–	0.8	V
Input voltage – High Logic State (Driver and Enable Inputs)	V <sub>IH</sub>	2.0	–	–	V
Input Clamp Voltage (Driver and Enable Inputs) (I <sub>IK</sub> = –18 mA)	V <sub>IK</sub>	–	–	–1.2	V
Input Current – Low Logic State (V <sub>IL</sub> = 0.4 V) (Enable Input) (Driver Inputs)	I <sub>IL</sub>	–	–	–0.36 –0.54	mA
Input Current – High Logic State (V <sub>IH</sub> = 2.7 V) (Enable Input) (Driver Inputs)	I <sub>IH</sub>	–	–	20 30	μA
Input Current – Maximum Voltage (V <sub>IH1</sub> = 5.5 V) (Enable or Driver Inputs)	I <sub>IH1</sub>	–	–	100	μA
Driver Output Voltage – Low Logic State (I <sub>OL</sub> = 40 mA) (I <sub>OL</sub> = 70 mA) (I <sub>OL</sub> = 100 mA)	V <sub>OL</sub> (D)	–	0.33 0.42 0.51	0.5 0.7 0.8	V
Driver (Bus) Leakage Current (V <sub>OH</sub> = 4.5 V) (V <sub>OL</sub> = 0.8 V)	I <sub>O</sub> (D)	–	–	100 –50	μA
Driver (Bus) Leakage Current (V <sub>CC</sub> = 0 V, V <sub>OH</sub> = 4.5 V)	I <sub>O1</sub> (D)	–	–	100	μA
Receiver Input High Threshold (V <sub>IH</sub> (E) = 2.4 V)	V <sub>TH</sub> (R)	2.25	2.0	–	V
Receiver Input Low Threshold (V <sub>IL</sub> (E) = 2.4 V)	V <sub>TL</sub> (R)	–	2.0	1.75	V
Receiver Output Voltage – Low Logic State (I <sub>OL</sub> = 20 mA)	V <sub>OL</sub> (R)	–	–	0.5	V
Receiver Output Voltage – High Logic State (I <sub>OH</sub> = –1.0 mA)	V <sub>OH</sub> (R)	2.7	3.4	–	V
Receiver Output Short–Circuit Current (Note1)	I <sub>OS</sub> (R)	–18	–	–60	mA
Power Supply Current – Output Low State (V <sub>IL</sub> (E) = 0 V)	I <sub>CC</sub>	–	45	70	mA

**NOTE:** 1. One output shorted at a time. Duration not to exceed 1.0 second.

## SWITCHING CHARACTERISTICS (V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C, unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Propagation Delay Time Driver Input to Output	t <sub>PLH</sub> (D) t <sub>PHL</sub> (D)	– –	10 10	15 15	ns
Propagation Delay Time Enable Input to Output	t <sub>PLH</sub> (E) t <sub>PHL</sub> (E)	– –	14 13	18 18	ns
Propagation Delay Time Bus to Receiver Output	t <sub>PLH</sub> (R) t <sub>PHL</sub> (R)	– –	10 10	15 15	ns
Rise and Fall Time of Driver Output	t <sub>TLH</sub> (D) t <sub>THL</sub> (D)	4.0 2.0	10 4.0	– –	ns

## SWITCHING WAVEFORMS AND CIRCUITS

Figure 1. Data Input to Bus Output (Driver)

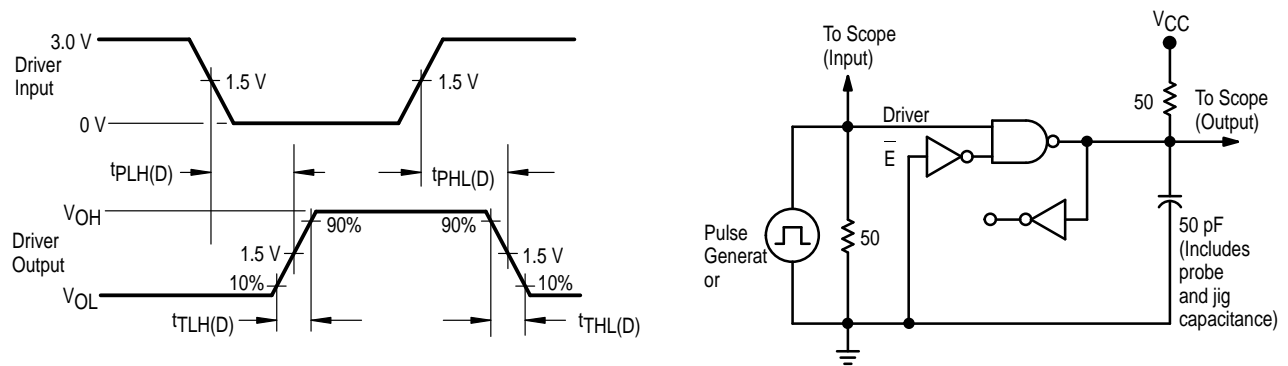


Figure 2. Enable Input to Bus Output (Driver)

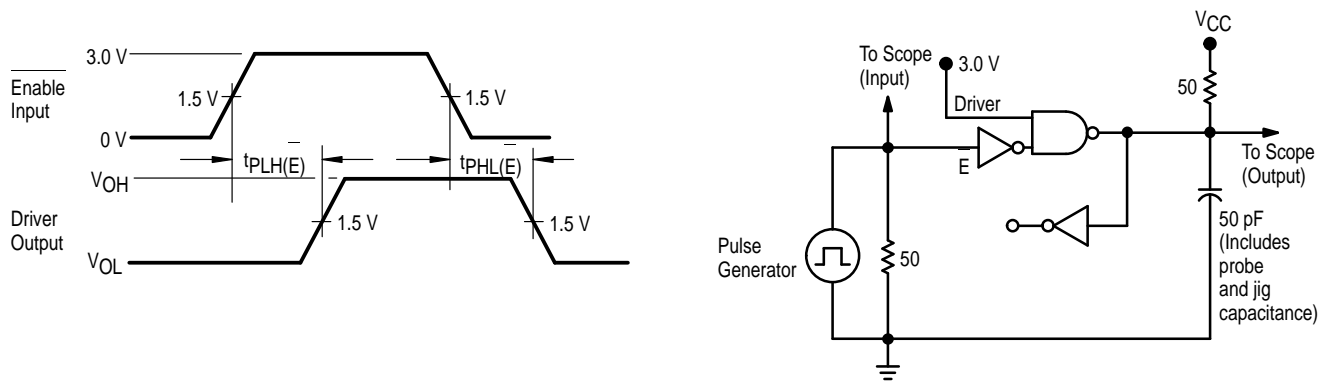
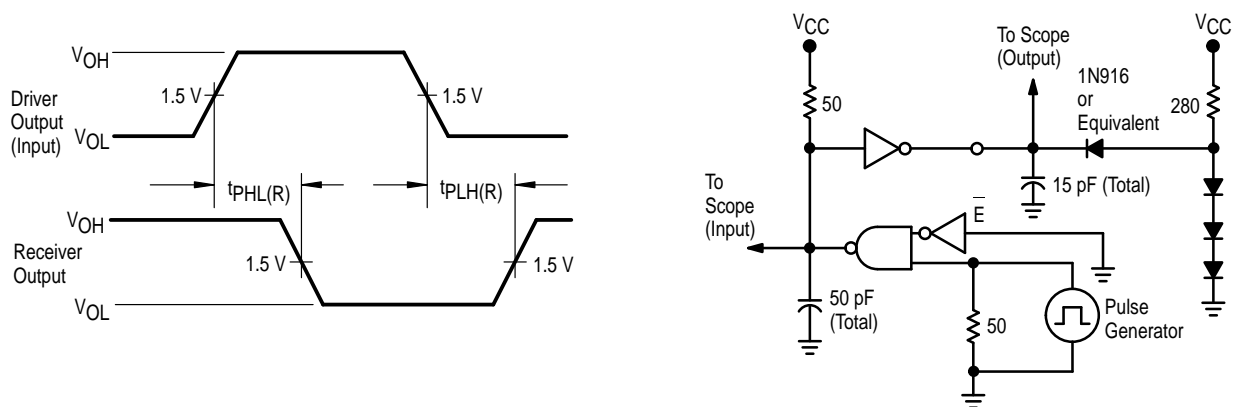


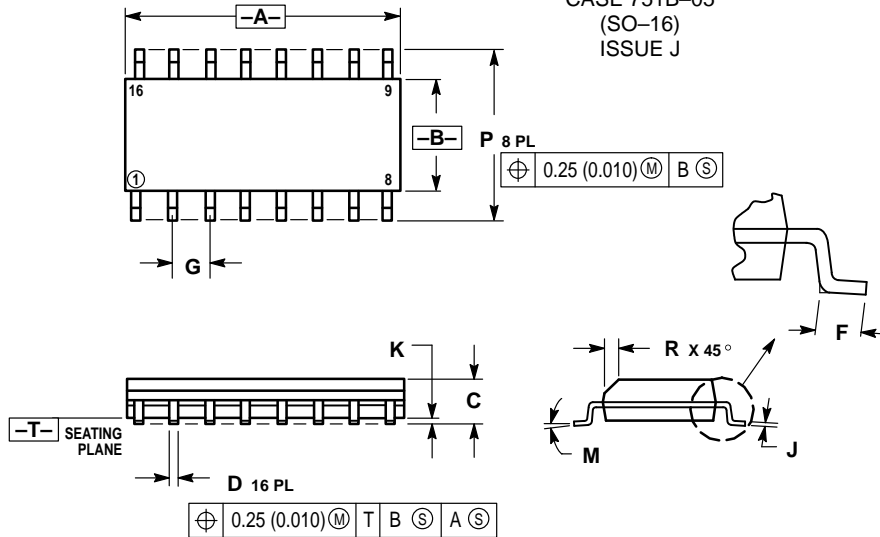
Figure 3. Bus Input to Receiver Output



# MC26S10

## OUTLINE DIMENSIONS

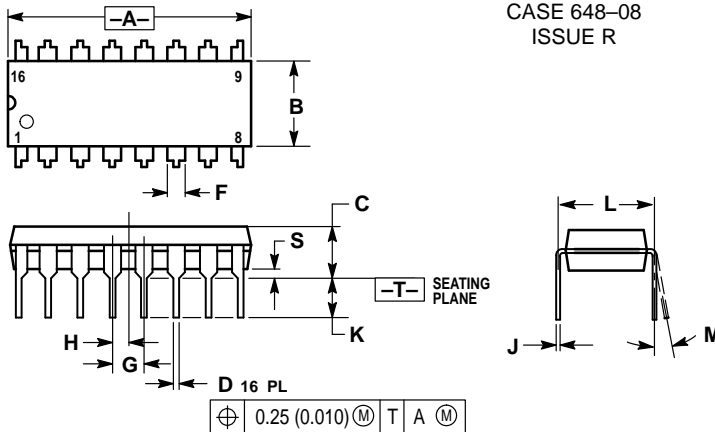
### D SUFFIX PLASTIC PACKAGE CASE 751B-05 (SO-16) ISSUE J



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: MILLIMETER.
  3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
  4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
  5. 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.


DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	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
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

### P SUFFIX PLASTIC PACKAGE CASE 648-08 ISSUE R



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.740	0.770	18.80	19.55
B	0.250	0.270	6.35	6.85
C	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	
H	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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters can and do vary in different applications. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and  are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

#### How to reach us:

USA/EUROPE: Motorola Literature Distribution;  
P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447

MFAX: RMFAX0@email.sps.mot.com - TOUCHTONE (602) 244-6609  
INTERNET: http://Design-NET.com

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, Toshikatsu Otsuki,  
6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-3521-8315

HONG KONG: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park,  
51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298



**MOTOROLA**

MC26S10/D

