I8216/I8226
4-BIT PARALLEL BIDIRECTIONAL BUS DRIVER

INDUSTRIAL

- **Data Bus Buffer Driver**
- **Low Input Load Current — .25 mA Maximum**
- **High Output Drive Capability for Driving System Data Bus**
- **3.65V Output High Voltage**
- **Three State Outputs**
- **Reduces System Package Count**
- **Industrial Temperature Range: −40° to +85°C**

The I8216/I8226 is a 4-bit bidirectional bus driver/receiver.

All inputs are low power TTL compatible. For driving MOS, the DO outputs provide a high 3.65V V_{OH}, and for high capacitance terminated bus structures, the DB outputs provide a high 50mA I_{OL} capability.

A non-inverting (I8216) and an inverting (I8226) are available to meet a wide variety of applications for buffering in microcomputer systems.

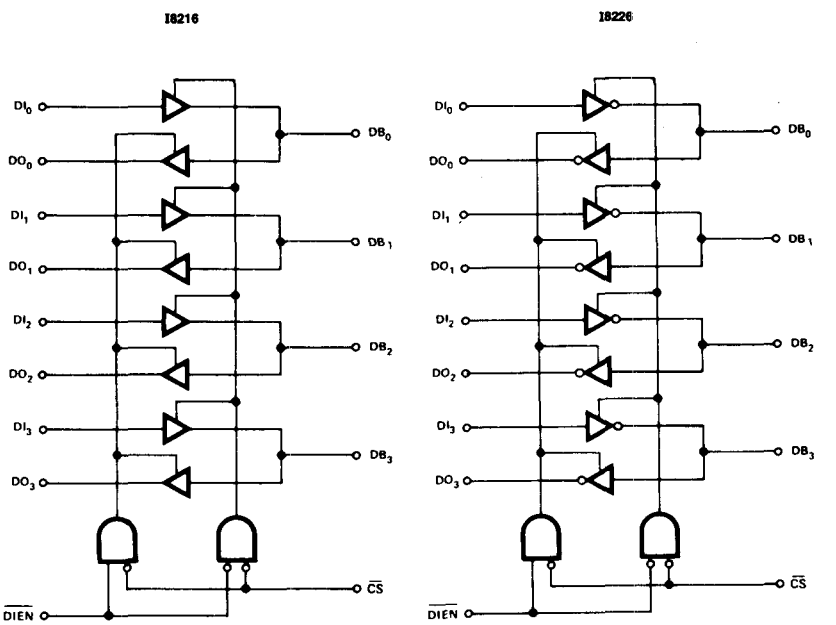
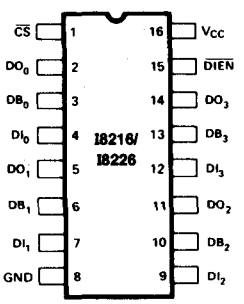


Figure 1. Logic Diagrams



DB_0-DB_3	DATA BUS BI-DIRECTIONAL
DI_0-DI_3	DATA INPUT
DO_0-DO_3	DATA OUTPUT
$\overline{DIEN}$	DATA IN ENABLE DIRECTION CONTROL
$\overline{CS}$	CHIP SELECT

Figure 2. Pin Configuration

ABSOLUTE MAXIMUM RATINGS*

Temperature Under Bias ..... −40°C to 85°C
Storage Temperature ..... −65°C to +150°C
All Output and Supply Voltages ..... −0.5V to +7V
All Input Voltages ..... −1.0V to +5.5V
Output Currents ..... 125 mA

NOTICE: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

D.C. CHARACTERISTICS (T_A = −40°C to 85°C, V_{CC} = +5V ±10%)

Symbol	Parameter		Limits Min.	Typ.	Max.	Unit	Conditions
I_{F1}	Input Load Current $\overline{DIEN}$, $\overline{CS}$			-0.15	-.5	mA	V_F = 0.45
I_{F2}	Input Load Current All Other Inputs			-0.08	-.25	mA	V_F = 0.45
I_{R1}	Input Leakage Current $\overline{DIEN}$, $\overline{CS}$				20	μA	V_R = 5.25V
I_{R2}	Input Leakage Current DI Inputs				10	μA	V_R = 5.25V
V_C	Input Forward Voltage Clamp				-1	V	I_C = -5mA
V_{IL}	Input "Low" Voltage				.95	V	
V_{IH}	Input "High" Voltage		2.0			V	
$\|I_{OL}\|$	Output Leakage Current (3-State)	DO DB			20 100	μA	V_O = 0.45V/5.25V
I_{CC}	Power Supply Current	8216		95	130	mA	
		8226		85	120	mA	
V_{OL1}	Output "Low" Voltage DO, DB Outputs			0.3	.45	V	DO Outputs I_{OL}=15mA DB Outputs I_{OL}=25mA
V_{OL2}	Output "Low" Voltage DB Outputs Only	8216		0.5	.6	V	DB Outputs I_{OL} = 50mA
		8226		0.5	.6	V	DB Outputs I_{OL} = 45mA
V_{OH1}	Output "High" Voltage	DO Outputs	3.65	4.0		V	DO Outputs I_{OH} = -1mA
V_{OH2}	Output "High" Voltage	DB Outputs	2.4	3.0		V	DB Outputs I_{OH} = -10mA
I_{OS}	Output Short Circuit Current		-15 -30	-35 -75	-65 -120	mA mA	DO Outputs $V_O \cong 0V$, DB Outputs V_{CC}=5.0V

NOTE: Typical values are for T_A = 25°C, V_{CC} = 5.0V.

CAPACITANCE (V_{BIAS} = 2.5V, V_{CC} = 5.0V, T_A = 25°C)

Symbol	Parameter	Limits Min.	Typ.[1]	Max.	Unit
C_{IN}	Input Capacitance		4	8	pF
C_{OUT1}	Output Capacitance		6	10	pF
C_{OUT2}	Output Capacitance		13	20	pF

A.C. CHARACTERISTICS (T_A = −40°C to 85°C, V_{CC} = +5V ±10%)

Symbol	Parameter	Limits Min.	Typ.[1]	Max.	Unit	Conditions
T_{PD1}	Input to Output Delay DO Outputs		15	25	ns	C_L=30pF, R_1=300Ω R_2=600Ω
T_{PD2}	Input to Output Delay DB Outputs 8216		20	30	ns	C_L=300pF, R_1=90Ω
	8226		16	25	ns	R_2 = 180Ω
T_E	Output Enable Time 8216		45	65	ns	(Note 2)
	8226		36	54	ns	(Note 2)
T_D	Output Disable Time		20	35	ns	(Note 2)

NOTES:
1. Typical values are for T_A = 25°C, V_{CC} = 5.0V.
2.

TEST	C_L	R_1	R_2
T_{PD1}	30 pF	300Ω	600Ω
T_{PD2}	300 pF	90Ω	180Ω
T_E (DO, ENABLE↑)	30 pF	10KΩ	1KΩ
T_E (DO, ENABLE↓)	30 pF	300Ω	600Ω
T_E (DB, ENABLE↑)	300 pF	10KΩ	1KΩ
T_E (DB, ENABLE↓)	300 pF	90Ω	180Ω
T_D (DO, DISABLE↑)	5 pF	300Ω	600Ω
T_D (DO, DISABLE↓)	5 pF	10KΩ	1KΩ
T_D (DB, DISABLE↑)	5 pF	90Ω	180Ω
T_D (DB, DISABLE↓)	5 pF	10KΩ	1KΩ

TEST CONDITIONS:

Input pulse amplitude of 2.5V.
Input rise and fall times of 5 ns between 1 and 2 volts.
Output loading is 5 mA and 10 pF.
Speed measurements are made at 1.5 volt levels.

A.C. TESTING LOAD CIRCUIT