



MILITARY TEMP.

M8216 4-BIT PARALLEL BI-DIRECTIONAL BUS DRIVER

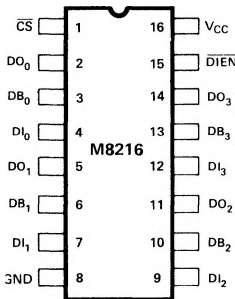
- Data Bus Buffer Driver for 8080 CPU
- Low Input Load Current: .25 mA Maximum
- High Output Drive Capability for Driving System Data Bus
- 16-Pin Dual In-Line Package
- 3.40V Output High Voltage for Direct Interface to 8080 CPU
- Three-State Outputs
- Full Military Temperature Range -55°C To +125°C
- ±10% Power Supply Tolerance

The M8216 is a 4-bit bi-directional bus driver/receiver.

All inputs are low power TTL compatible. For driving MOS, the DO outputs provide a high 3.40V V_{OH} , and for high capacitance terminated bus structures, the DB outputs provide a high 50mA I_{OL} capability.

The M8216 is used to meet a wide variety of applications for buffering in microcomputer systems.

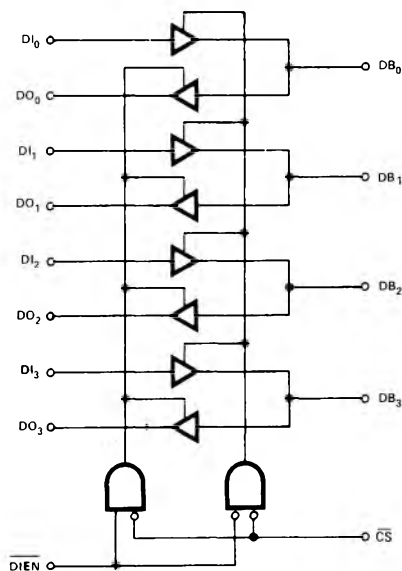
PIN CONFIGURATION



PIN NAMES

DB ₀ -DB ₃	DATA BUS BI-DIRECTIONAL
D ₀ -D ₃	DATA INPUT
DO ₀ -DO ₃	DATA OUTPUT
DIEN	DATA IN ENABLE DIRECTION CONTROL
CS	CHIP SELECT

LOGIC DIAGRAM 8216



D.C. AND OPERATING CHARACTERISTICS

ABSOLUTE MAXIMUM RATINGS*

Temperature Under Bias	-55°C to +125°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

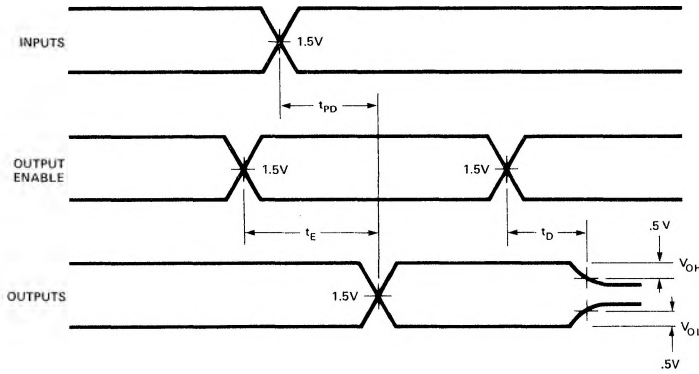
*COMMENT: Stresses above those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.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

$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$, $V_{CC} = +5\text{V} \pm 10\%$

Symbol	Parameter	Limits			Unit	Conditions
		Min.	Typ.	Max.		
I_{F1}	Input Load Current DIEN, 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 DIEN, CS			20	μA	$V_R = 5.5\text{V}$
I_{R2}	Input Leakage Current DI Inputs			10	μA	$V_R = 5.5\text{V}$
V_C	Input Forward Voltage Clamp			-1.2	V	$I_C = -5\text{mA}$
V_{IL}	Input "Low" Voltage			.95	V	$V_{CC} = 5\text{V}$
V_{IH}	Input "High" Voltage	2.0			V	$V_{CC} = 5\text{V}$
$ I_{O1} $	Output Leakage Current (3-State)			20 100	μA	$V_O = .45\text{V}$ to V_{CC}
I_{CC}	Power Supply Current		95	130	mA	
V_{OL1}	Output "Low" Voltage		0.3	.45	V	DO Outputs $I_{OL} = 15\text{mA}$ DB Outputs $I_{OL} = 25\text{mA}$
V_{OL2}	Output "Low" Voltage		0.5	.6	V	DB Outputs $I_{OL} = 50\text{mA}$
V_{OH1}	Output "High" Voltage	3.4	3.8		V	DO Outputs $I_{OH} = -.5\text{mA}$
V_{OH2}	Output "High" Voltage	2.4	3.0		V	DO Outputs $I_{OH} = -2\text{mA}$ DB Outputs $I_{OH} = -5.0\text{mA}$
I_{OS}	Output Short Circuit Current	-15 -30	-35 -75	-65 -120	mA mA	DO Outputs $V_{CC} = 5.0\text{V}$ DB Outputs $V_{CC} = 5.0\text{V}$

NOTE: Typical values are for $T_A = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$.

WAVEFORMS



A.C. CHARACTERISTICS

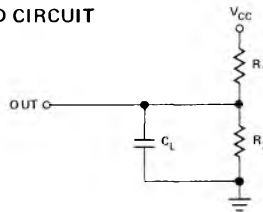
$T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$, $V_{CC} = +5\text{V} \pm 10\%$

Symbol	Parameter	Limits			Unit	Conditions
		Min.	Typ.[1]	Max.		
T_{PD1}	Input to Output Delay DO Outputs		15	25	ns	(NOTE 2)
T_{PD2}	Input to Output Delay DB Outputs		20	33	ns	(NOTE 2)
T_E	Output Enable Time		45	75	ns	(NOTE 2)
T_D	Output Disable Time		20	40	ns	(NOTE 2)

TEST CONDITIONS:

Input pulse amplitude of 2.5V.
Input rise and fall times of 5 ns between 1 and 2 volts.

TEST LOAD CIRCUIT



CAPACITANCE

Symbol	Parameter	Limits			Unit
		Min.	Typ.[1]	Max.	
C_{IN}	Input Capacitance		4	6	pF
C_{OUT1}	Output Capacitance DO Outputs		6	10	pF
C_{OUT2}	Output Capacitance DB Outputs		13	18	pF

TEST CONDITIONS: $V_{BIAS} = 2.5\text{V}$, $V_{CC} = 5.0\text{V}$, $T_A = 25^\circ\text{C}$, $f = 1\text{MHz}$.

- NOTES: 1. Typical values are for $T_A = 25^\circ\text{C}$, $V_{CC} = 5.0\text{V}$.
2.

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