

MOTOROLA SEMICONDUCTOR

TECHNICAL DATA

QUAD THREE-STATE BUS TRANSCEIVER

This quad three-state bus transceiver features both excellent MOS or MPU compatibility, due to its high impedance PNP transistor input, and high-speed operation made possible by the use of Schottky diode clamping. Both the -48 mA driver and -20 mA receiver outputs are short-circuit protected and employ three-state enabling inputs.

The device is useful as a bus extender in systems employing the M6800 family or other comparable MPU devices. The maximum input current of 200 μ A at any of the device input pins assures proper operation despite the limited drive capability of the MPU chip. The inputs are also protected with Schottky-barrier diode clamps to suppress excessive undershoot voltages.

The MC8T26A is identical to the NE8T26A and it operates from a single +5 V supply.

- High Impedance Inputs
- Single Power Supply
- High Speed Schottky Technology
- Three State Drivers and Receivers
- Compatible with M6800 Family Microprocessor

MC8T26A (MC6880A)

QUAD THREE-STATE BUS TRANSCEIVER

MONOLITHIC SCHOTTKY
INTEGRATED CIRCUITS

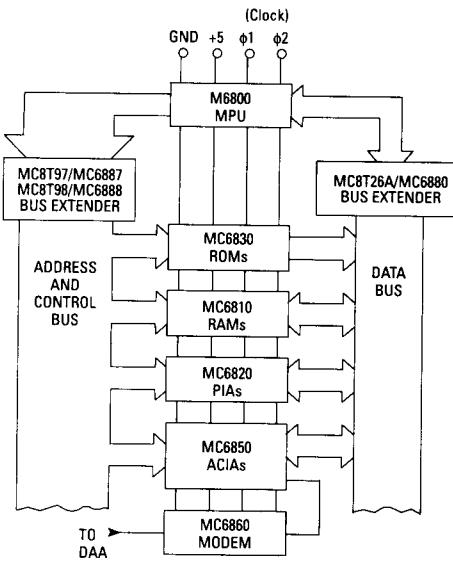


L SUFFIX
CERAMIC PACKAGE
CASE 620

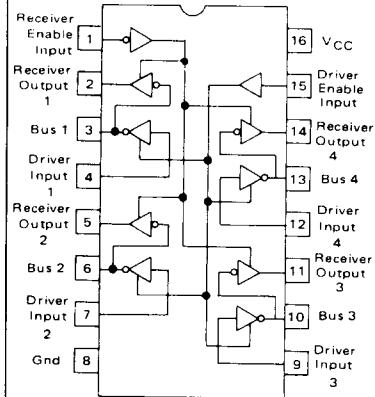


P SUFFIX
PLASTIC PACKAGE
CASE 648

MICROPROCESSOR BUS EXTENDER APPLICATION



PIN CONNECTIONS — MC8T26A (MC6880A)



ORDERING INFORMATION

Device	Alternate	Temperature Range	Package
MC8T26AL	MC6880AL	0 to +75°C	Ceramic DIP
MC8T26AP	MC6880AP		Plastic DIP

MC8T26A

MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V _{CC}	8.0	Vdc
Input Voltage	V _I	5.5	Vdc
Junction Temperature Ceramic Package Plastic Package	T _J	175 150	°C
Operating Ambient Temperature Range	T _A	0 to +75	°C
Storage Temperature Range	T _{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS (4.75 V $\leq V_{CC} \leq$ 5.25 V and 0°C $\leq T_A \leq$ 75°C unless otherwise noted.)

Characteristic	Symbol	Min	Typ	Max	Unit
Input Current – Low Logic State (Receiver Enable Input, $V_{IL(\text{RE})} = 0.4$ V) (Driver Enable Input, $V_{IL(\text{DE})} = 0.4$ V) (Driver Input, $V_{IL(\text{D})} = 0.4$ V) (Bus (Receiver) Input, $V_{IL(\text{B})} = 0.4$ V)	I _{IL(RE)} I _{IL(DE)} I _{IL(D)} I _{IL(B)}	— — — —	— — — —	-200 +200 -200 -200	μA
Input Disabled Current – Low Logic State (Driver Input, $V_{IL(\text{D})} = 0.4$ V)	I _{IL(D)} DIS	—	—	-25	μA
Input Current-High Logic State (Receiver Enable Input, $V_{IH(\text{RE})} = 5.25$ V) (Driver Enable Input, $V_{IH(\text{DE})} = 5.25$ V) (Driver Input, $V_{IH(\text{D})} = 5.25$ V) (Receiver Input, $V_{IH(\text{B})} = 5.25$ V)	I _{IH(RE)} I _{IH(DE)} I _{IH(D)} I _{IH(B)}	— — — —	— — — —	25 25 25 100	μA
Input Voltage – Low Logic State (Receiver Enable Input) (Driver Enable Input) (Driver Input) (Receiver Input)	V _{IL(\text{RE})} V _{IL(\text{DE})} V _{IL(\text{D})} V _{IL(\text{B})}	— — — —	— — — —	0.85 0.85 0.85 0.85	V
Input Voltage – High Logic State (Receiver Enable Input) (Driver Enable Input) (Driver Input) (Receiver Input)	V _{IH(\text{RE})} V _{IH(\text{DE})} V _{IH(\text{D})} V _{IH(\text{B})}	2.0 2.0 2.0 2.0	— — — —	— — — —	V
Output Voltage – Low Logic State (Bus Driver) Output, $I_{OL(\text{B})} = 48$ mA (Receiver Output, $I_{OL(\text{R})} = 20$ mA)	V _{OL(\text{B})} V _{OL(\text{R})}	— —	— —	0.5 0.5	V
Output Voltage – High Logic State (Bus (Driver) Output, $I_{OH(\text{B})} = -10$ mA) (Receiver Output, $I_{OH(\text{R})} = -2.0$ mA) (Receiver Output, $I_{OH(\text{R})} = -100$ μA, $V_{CC} = 5.0$ V)	V _{OH(\text{B})} V _{OH(\text{R})}	2.4 2.4 3.5	3.1 3.1 —	— — —	V
Output Disabled Leakage Current – High Logic State (Bus Driver) Output, $V_{OH(\text{B})} = 2.4$ V (Receiver Output, $V_{OH(\text{R})} = 2.4$ V)	I _{OHL(B)} I _{OHL(R)}	— —	— —	100 100	μA
Output Disabled Leakage Current – Low Logic State (Bus Output, $V_{OL(\text{B})} = 0.5$ V) (Receiver Output, $V_{OL(\text{R})} = 0.5$ V)	I _{OLL(B)} I _{OLL(R)}	— —	— —	-100 -100	μA
Input Clamp Voltage (Driver Enable Input $I_{ID(\text{DE})} = -12$ mA) (Receiver Enable Input $I_{IC(\text{RE})} = +12$ mA) (Driver Input $I_{IC(\text{D})} = -12$ mA)	V _{IC(DE)} V _{IC(RE)} V _{IC(D)}	— — —	— — —	-1.0 -1.0 -1.0	V
Output Short Circuit Current, $V_{CC} = 5.25$ V, Note 1 (Bus (Driver) Output) (Receiver Output)	I _{OS(B)} I _{OS(R)}	-50 -30	— —	-150 -75	mA
Power Supply Current ($V_{CC} = 5.25$ V)	I _{CC}	—	—	87	mA

Note 1. Only one output may be short-circuited at a time.

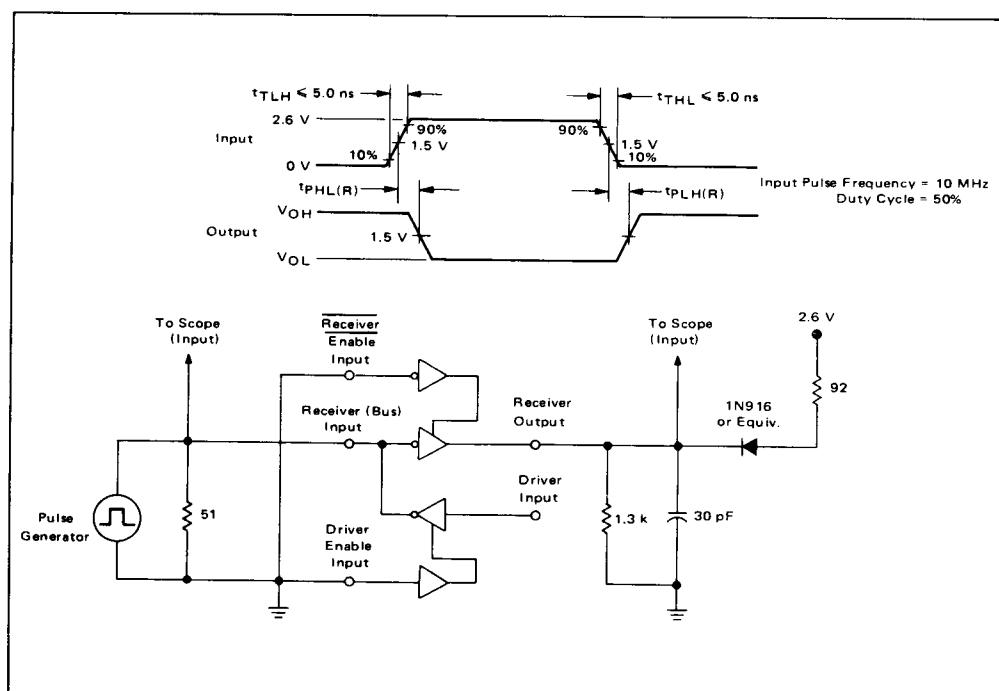
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SWITCHING CHARACTERISTICS (Unless otherwise noted, specifications apply at $T_A = 25^\circ\text{C}$ and $V_{CC} = 5.0 \text{ V}$)

Characteristic	Symbol	Figure	Min	Max	Unit
Propagation Delay Time from Receiver (Bus) Input to High Logic State Receiver Output	$t_{PLH(R)}$	1	—	14	ns
Propagation Delay Time from Receiver (Bus) Input to Low Logic State Receiver Output	$t_{PHL(R)}$	1	—	14	ns
Propagation Delay Time from Driver Input to High Logic State Driver (Bus) Output	$t_{PLH(D)}$	2	—	14	ns
Propagation Delay Time from Driver Input to Low Logic State Driver (Bus) Output	$t_{PHL(D)}$	2	—	14	ns
Propagation Delay Time from Receiver Enable Input to High Impedance (Open) Logic State Receiver Output	$t_{PLZ(RE)}$	3	—	15	ns
Propagation Delay Time from Receiver Enable Input to Low Logic Level Receiver Output	$t_{PZL(RE)}$	3	—	20	ns
Propagation Delay Time from Driver Enable Input to High Impedance Logic State Driver (Bus) Output	$t_{PLZ(DE)}$	4	—	20	ns
Propagation Delay Time from Driver Enable Input to Low Logic State Driver (Bus) Output	$t_{PZL(DE)}$	4	—	25	ns

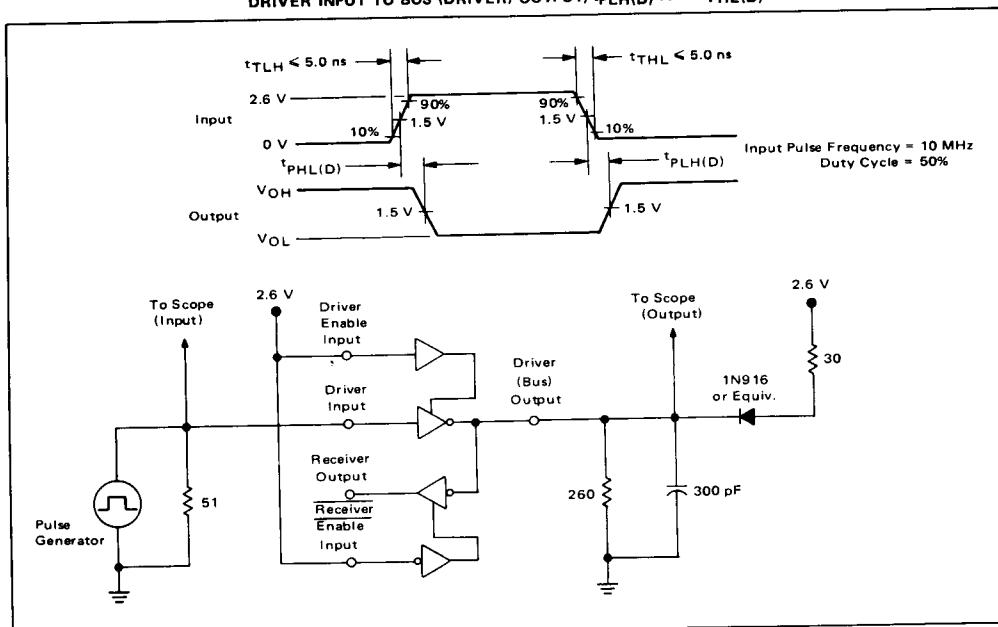
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FIGURE 1 – TEST CIRCUIT AND WAVEFORMS FOR PROPAGATION DELAY FROM BUS (RECEIVER) INPUT TO RECEIVER OUTPUT, $t_{PLH(R)}$ AND $t_{PHL(R)}$



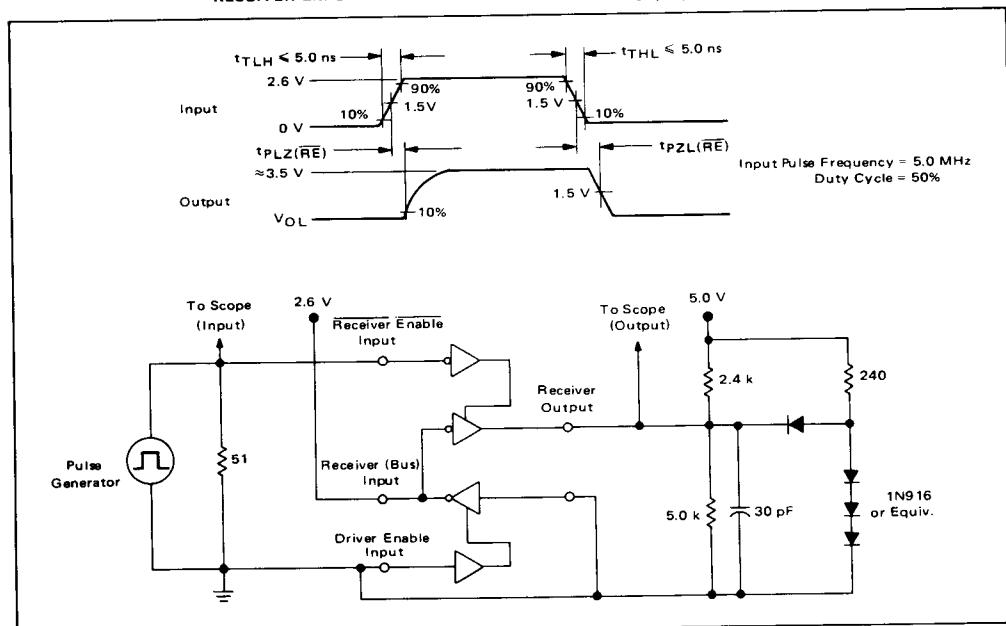
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FIGURE 2 – TEST CIRCUIT AND WAVEFORMS FOR PROPAGATION DELAY TIME FROM DRIVER INPUT TO BUS (DRIVER) OUTPUT, $t_{PLH(D)}$ AND $t_{PHL(D)}$



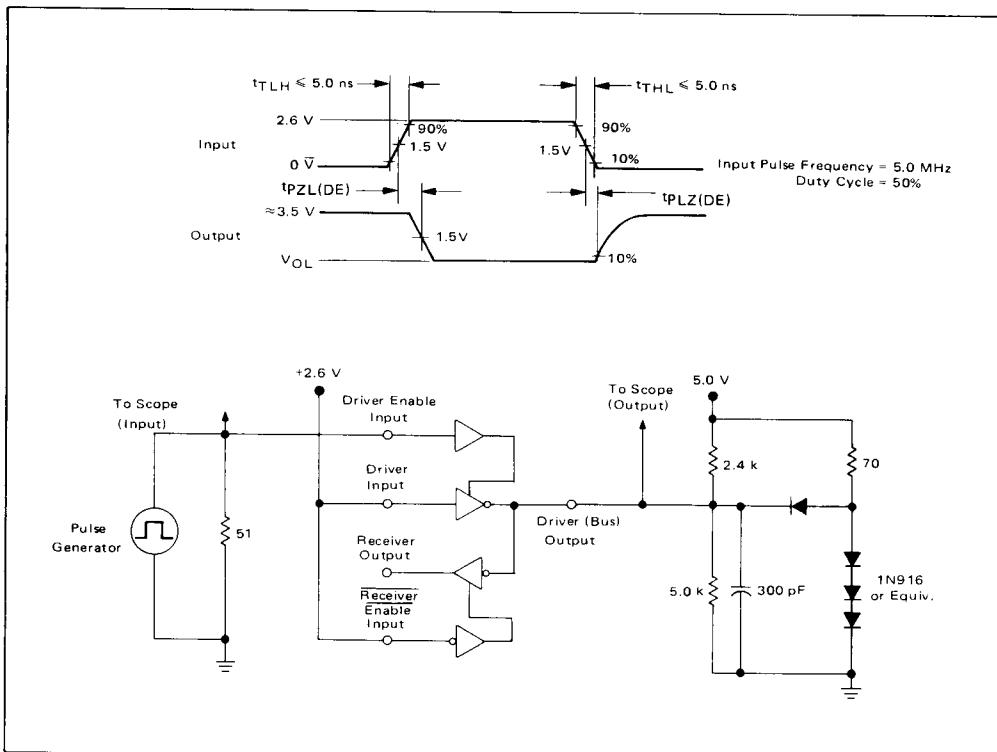
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FIGURE 3 – TEST CIRCUIT AND WAVEFORMS FOR PROPAGATION DELAY TIME FROM RECEIVER ENABLE INPUT TO RECEIVER OUTPUT, $t_{PLZ(RE)}$ AND $t_{PZL(RE)}$



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FIGURE 4 – TEST CIRCUIT AND WAVEFORMS FOR PROPAGATION DELAY TIMES FROM DRIVER ENABLE INPUT TO DRIVER (BUS) OUTPUT, $t_{PLZ(DE)}$ AND $t_{PLH(DE)}$



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FIGURE 5 – BIDIRECTIONAL BUS APPLICATIONS

