

# Am7838 • Am8838

## Quad Unified Bus Transceiver

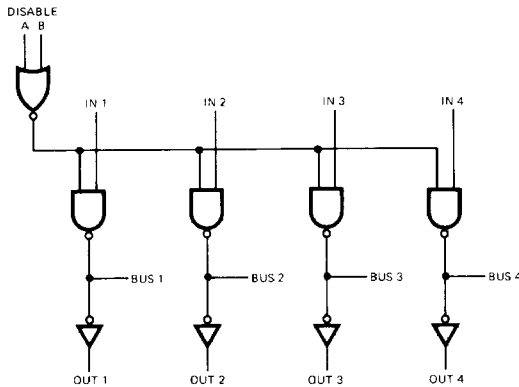
### DISTINCTIVE CHARACTERISTICS

- 4 totally separate driver/receiver pairs per package.
- 1V typical receiver input hysteresis
- Receiver hysteresis independent of receiver output load
- Guaranteed minimum bus noise immunity of 1.3V, 2V typ.
- Temperature insensitive receiver thresholds track bus logic levels
- 20 $\mu$ A typical bus terminal current with normal  $V_{CC}$  or with  $V_{CC} = 0V$
- Open collector driver output allows wire-OR connection
- High-Speed
- Series 74 TTL compatible driver and disable inputs and receiver outputs
- Advanced Schottky processing

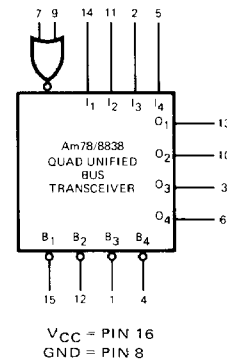
### FUNCTIONAL DESCRIPTION

The Am7838 • Am8838 are quad high-speed drivers/receivers designed for use in bus organized data transmission systems interconnected by terminated 120 $\Omega$  impedance lines. The external termination is intended to be a 180 $\Omega$  resistor from the bus to the +5V logic supply together with a 390 $\Omega$  resistor from the bus to ground. The bus can be terminated at one or both ends. Low bus pin current allows up to 27 driver/receiver pairs to utilize a common bus. The bus loading is unchanged when  $V_{CC} = 0V$ . The receivers incorporate hysteresis to greatly enhance bus noise immunity. One two-input NOR gate is included to disable all drivers in a package simultaneously. Receiver performance is optimized for systems with bus rise and fall times  $\leq 1.0\mu s/V$ .

### LOGIC DIAGRAM AND LOGIC SYMBOL



LIC-541

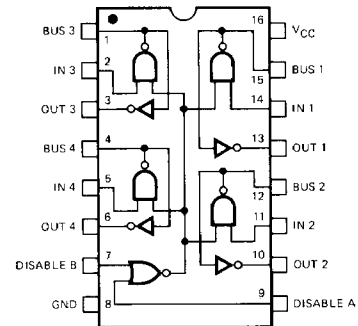


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### ORDERING INFORMATION

Package Type	Temperature Range	Order Number
Hermetic DIP	-55°C to +125°C	DS7838J
Hermetic DIP	0°C to +70°C	DS8838J
Molded DIP	0°C to +70°C	DS8838N

### CONNECTION DIAGRAM Top View



Note: Pin 1 is marked for orientation.

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**Am7838 • Am8838****MAXIMUM RATINGS** (Above which the useful life may be impaired)

Supply Voltage	7.0V
Input and Output Voltage	5.5V
Power Dissipation	600mW
Operating Temperature Range	
Am7838	-55°C to +125°C
Am8838	0°C to +70°C
Storage Temperature Range	-65°C to +150°C
Lead Temperature (Soldering, 10 sec.)	300°C

**ELECTRICAL CHARACTERISTICS**

The following conditions apply unless otherwise specified:

Am7838 (MIL)	$T_A = -55^\circ\text{C to } +125^\circ\text{C}$	$V_{CC\text{MIN}} = 4.50\text{V}$	$V_{CC\text{MAX}} = 5.50\text{V}$
Am8838 (COM'L)	$T_A = 0^\circ\text{C to } +70^\circ\text{C}$	$V_{CC\text{MIN}} = 4.75\text{V}$	$V_{CC\text{MAX}} = 5.25\text{V}$

Parameters	Description	Test Conditions	Min.	Typ. (Note 1)	Max.	Units
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**Driver and Disable Inputs**

$V_{IH}$	Logical "1" Input Voltage		2.0			Volts
$V_{IL}$	Logical "0" Input Voltage				0.8	Volts
$I_I$	Logical "1" Input Current	$V_{IN} = 5.5\text{V}$			1.0	mA
$I_{IH}$	Logical "1" Input Current	$V_{IN} = 2.4\text{V}$			40	$\mu\text{A}$
$I_{IL}$	Logical "0" Input Current	$V_{IN} = 0.4\text{V}$			-1.6	mA
$V_{CL}$	Input Diode Clamp Voltage	$I_{DIS} = -12\text{mA}$ , $I_{IN} = -12\text{mA}$ , $I_{BUS} = -12\text{mA}$ , $T_A = 25^\circ\text{C}$		-1.0	-1.5	Volts

**Driver Output/Receiver Input**

Driver Output/Receiver Input							
V <sub>OLB</sub>	Low Level Bus Voltage	V <sub>DIS</sub> = 0.8V, V <sub>IN</sub> = 2.0V, I <sub>BUS</sub> = 50mA		0.4	0.7	Volts	
I <sub>IHB</sub>	Maximum Bus Current	V <sub>IN</sub> = 0.8V, V <sub>BUS</sub> = 4.0V, V <sub>CC</sub> = V <sub>MAX</sub>		20	100	μA	
I <sub>ILB</sub>	Maximum Bus Current	V <sub>IN</sub> = 0.8V, V <sub>BUS</sub> = 4.0V, V <sub>CC</sub> = 0V		2.0	100	μA	
V <sub>IH</sub>	High Level Receiver Threshold	V <sub>IND</sub> = 0.8V, V <sub>OL</sub> = 16mA	Am7838	1.65	2.25	2.65	Volts
			Am8838	1.80	2.25	2.50	
V <sub>IL</sub>	Low Level Receiver Threshold	V <sub>IND</sub> = 0.8V, V <sub>OH</sub> = -400μA	Am7838	0.97	1.30	1.63	Volts
			Am8838	1.05	1.30	1.55	

**Receiver Output**

$V_{OH}$	Logical "1" Output Voltage	$V_{IN} = 0.8\text{V}$ , $V_{BUS} = 0.5\text{V}$ , $I_{OH} = -400\mu\text{A}$	2.4			Volts
$V_{OL}$	Logical "0" Output Voltage	$V_{IN} = 0.8\text{V}$ , $V_{BUS} = 4.0\text{V}$ , $I_{OL} = 16\text{mA}$		0.25	0.4	Volts
$I_{OS}$	Output Short Circuit Current	$V_{DIS} = 0.8\text{V}$ , $V_{IN} = 0.8\text{V}$ , $V_{BUS} = 0.5\text{V}$ , $V_{OS} = 0\text{V}$ , $V_{CC} = V_{MAX}$ , (Note 3)	-18		-55	mA
$I_{CC}$	Supply Current	$V_{DIS} = 0\text{V}$ , $V_{IN} = 2.0\text{V}$ , (Per Package)		50	70	mA

**AC CHARACTERISTICS** ( $V_{CC} = 5.0\text{V}$ ,  $T_A = 25^\circ\text{C}$  unless otherwise specified)

$t_{pd}$	Propagation Delays	Disable to Bus "1"	(Note 4)		19	30	ns
		Disable to Bus "0"	(Note 4)		15	23	ns
		Driver Input to Bus "1"	(Note 4)		17	25	ns
		Driver Input to Bus "0"	(Note 4)		9.0	15	ns
		Bus to Logical "1" Receiver Output	(Note 5)		20	30	ns
		Bus to Logical "0" Receiver Output	(Note 6)		18	30	ns

Notes: 1. Typical values are for  $T_A = 25^\circ\text{C}$  and  $V_{CC} = 5.0\text{V}$ .

2. All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max. or min. on absolute value basis.

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

4.  $91\Omega$  from bus pin to  $V_{CC}$  and  $200\Omega$  from bus pin to ground,  $C_{LOAD} = 15\text{pF}$  total. Measured from  $V_{IN} = 1.5\text{V}$  to  $V_{BUS} = 1.5\text{V}$ ,  $V_{IN} = 0\text{V}$  to  $3.0\text{V}$  pulse.

5. Fan-out of 10 load,  $C_{LOAD} = 15\text{pF}$  total. Measured from  $V_{IN} = 1.3\text{V}$  to  $V_{OUT} = 1.5\text{V}$ ,  $V_{IN} = 0\text{V}$  to  $3.0\text{V}$  pulse.

6. Fan out of 10 load,  $C_{LOAD} = 15\text{pF}$  total. Measured from  $V_{IN} = 2.3\text{V}$  to  $V_{OUT} = 1.5\text{V}$ ,  $V_{IN} = 0\text{V}$  to  $3.0\text{V}$  pulse.