Am29861 – 64

High Performance Bus Transceivers

DISTINCTIVE CHARACTERISTICS

- High-speed symmetrical bidirectional transceivers
  - Noninverting t_{PD} = 5.0ns typ
  - Inverting t_{PD} = 4.5ns typ
- 200mV minimum input hysteresis on input data ports
- Three-state outputs glitch-free during power-up and down. Outputs have Schottky clamp to ground
- 48mA commercial I_{OL}, 32mA military I_{OL}
- Low input/output capacitance
- I_{OH} specified 2.0V and 2.4V

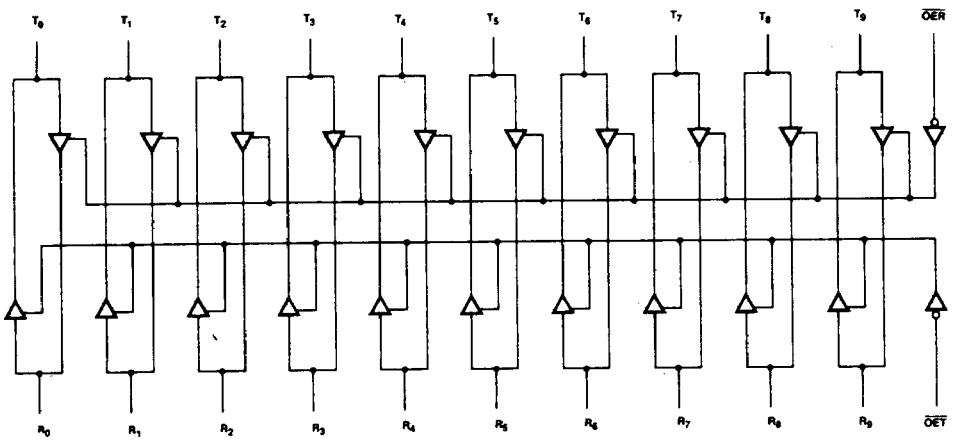
GENERAL DESCRIPTION

The Am29860 Series bus transceivers provide high performance bus interface buffering for wide data/address paths or buses carrying parity. The Am29863/64 9-bit transceivers have NOR-ed output enables for maximum control flexibility. All transceiver data inputs have 200mV minimum input hysteresis to provide improved noise rejection.

All of the Am29800 high performance interface family are designed for high capacitance load drive capability while providing low capacitance bus loading at both inputs and outputs. All inputs are Schottky diode inputs, and all outputs are designed for low capacitance bus loading in the high impedance state.

BLOCK DIAGRAM

Am29861/Am29862 10-BIT TRANSCEIVERS



BD001060

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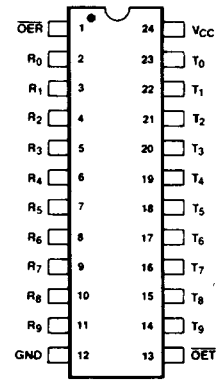
Refer to Page 13-1 for Essential Information on Military Devices

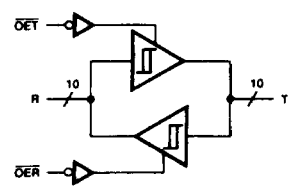
CONNECTION DIAGRAM
Top View

Am29861/Am29862 10-BIT TRANSCEIVERS



CD001150

LOGIC SYMBOL



Am29861 (NONINVERTING)

LS000370

ORDERING INFORMATION

AMD products are available in several packages and operating ranges. The order number is formed by a combination of the following: Device number, speed option (if applicable), package type, operating range and screening option (if desired).

Am29861 – 64 **D** **C** **B**

- B — Screening Option
  - Blank – Standard processing
  - B – Burn-in
- C — Temperature (See Operating Range)
  - C – Commercial (0°C to +70°C)
  - M – Military (–55°C to +125°C)
- D — Package
  - D – 24-pin SLIM DIP (D-24-SLIM)
  - L – 28-pin Leadless Chip Carrier (L-28-1)
  - X – Dice
- Am29861 – 64 — Device type
  - High Performance Bus Transceiver

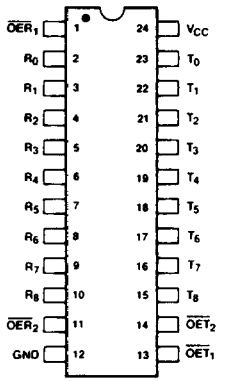
Valid Combinations	
Am29861 Am29862 Am29863 Am29864	DC, DCB, DM, DMB LC, LCB, LM, LMB XC, XM

Valid Combinations

Consult the AMD sales office in your area to determine if a device is currently available in the combination you wish.

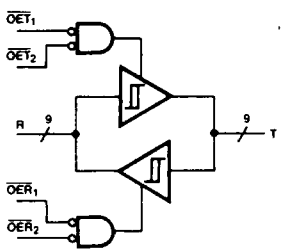
CONNECTION DIAGRAM
Top View

Am29863/Am29864 9-BIT TRANSCEIVERS



CD001140

LOGIC SYMBOL



Am29863 (NONINVERTING)

LS000380

PIN DESCRIPTION

Pin No.	Name	I/O	Description
Am29861/Am29862			
1	$\overline{OER}$	I	When LOW in conjunction with $\overline{OET}$ HIGH activates the RECEIVE mode.
13	$\overline{OET}$	I	When LOW in conjunction with $\overline{OER}$ HIGH activates the TRANSMIT mode.
	R_i	I/O	10-bit RECEIVE input/output.
	T_i	I/O	10-bit TRANSMIT input/output.
Am29863/Am29864			
	$\overline{OER}_i$	I	When both are LOW in conjunction with any $\overline{OET}_i$ HIGH indicates the RECEIVE mode.
	OET_i	I	When both are LOW in conjunction with any $\overline{OER}_i$ HIGH indicates the TRANSMIT mode.
	R_i	I/O	9-bit RECEIVE input/output.
	T_i	I/O	9-bit TRANSMIT input/output.

FUNCTION TABLES

Am29861/Am2983 (Noninverting)

Inputs				Outputs		
$\overline{OET}$	$\overline{OER}$	R_i	T_i	R_i	T_i	Function
L	H	L	N/A	N/A	L	Transmitting
L	H	H	N/A	N/A	H	Transmitting
H	L	N/A	L	L	N/A	Receiving
H	L	N/A	H	H	N/A	Receiving
H	H	X	X	Z	Z	Hi-Z

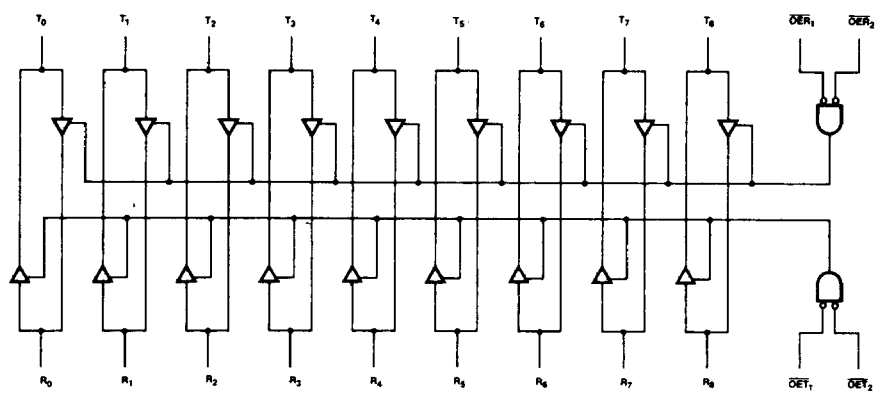
Am29862/Am29864 (Inverting)

Inputs				Outputs		
$\overline{OET}$	$\overline{OER}$	R_i	$\overline{T}_i$	R_i	$\overline{T}_i$	Function
L	H	L	N/A	N/A	H	Transmitting
L	H	H	N/A	N/A	L	Transmitting
H	L	N/A	L	H	N/A	Receiving
H	L	N/A	H	L	N/A	Receiving
H	H	X	X	Z	Z	Hi-Z

H = HIGH
L = LOW
Z = High Impedance

X = Don't Care
N/A = Not Applicable

Am29863/Am29864
9-BIT TRANSCEIVERS



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ABSOLUTE MAXIMUM RATINGS

Storage Temperature ..... −65°C to +150°C
Ambient Temperature with
Power Applied ..... −55°C to +125°C
Supply Voltage to Ground Potential
Continuous ..... −0.5V to +7.0V
DC Voltage Applied to Output
for High Output State ..... −1.5V to V_{CC} max
DC Input voltage ..... −0.5V to +5.5V
DC Output Current, Into Outputs 100mA
DC Input Current ..... −30mA to +5.0mA

Stresses above those listed under ABSOLUTE MAXIMUM RATINGS may cause permanent device failure. Functionality at or above these limits is not implied. Exposure to absolute maximum ratings for extended periods may affect device reliability.

OPERATING RANGES

Commercial (C) Devices
Temperature ..... 0°C to +70°C
Supply Voltage ..... +4.75V to +5.25V

Military (M) Devices
Temperature ..... −55°C to +125°C
Supply Voltage ..... +4.5V to +5.5V

Operating ranges define those limits over which the functionality of the device is guaranteed.

DC CHARACTERISTICS over operating range unless otherwise specified

Parameter	Description	Test Conditions		Min	Typ	Max	Units
V_{OH}	Output HIGH Voltage	V_{CC} = MIN V_{IN} = V_{IH} or V_{IL}	I_{OH} = −15mA	2.4			V
			I_{OH} = −24mA	2.0			
V_{OL}	Output LOW Voltage	V_{CC} = MIN V_{IN} = V_{IH} or V_{IL}	MIL, I_{OL} = 32mA			0.5	V
			COM'L, I_{OL} = 48mA			0.5	
V_{IH}	Input HIGH Level	Guaranteed input logical HIGH voltage for all inputs		2.0			V
V_{IL}	Input LOW Level	Guaranteed input logical LOW voltage for all inputs				0.8	V
V_I	Input Clamp Voltage	V_{CC} = MIN, I_{IN} = −18mA				−1.2	V
V_{HYST}	Input Hysteresis	Tested output is connected to AC load test circuit		200			mV
I_{IL}	Input LOW Current	V_{CC} = MAX, V_{IN} = 0.4V				−1.0.	mA
I_{IH}	Input HIGH Current	V_{CC} = MAX, V_{IN} = 2.7V				50	μA
I_I	Input HIGH Current	V_{CC} = MAX, V_{IN} = 5.5V				1.0	mA
I_{OZH}	Output Off-State Output Current (HI-Z)	V_{CC} = MAX, V_O = 2.4V				50	μA
I_{OZL}	Output Off-State Output Current (HI-Z)	V_{CC} = MAX, V_O = 0.4V				−1.0	mA
I_{SC}	Output Short Circuit Current	V_{CC} = MAX		−75		−250	mA
I_{CC}	Supply Current	V_{CC} = MAX Outputs Open	Over Temperature Range			160	mA
			+70°C			150	
			+125°C			140	

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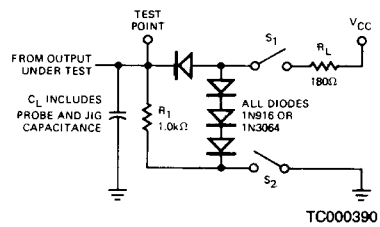
SWITCHING TEST CIRCUIT



Note: Pulse Generator for All Pulses: Rate ≤ 10MHz; $Z_O = 50\Omega$; $t_r \leq 2.5$ns; $t_f \leq 2.5$ns.

SWITCHING CHARACTERISTICS ($T_A = +25°C$, $V_{CC} = 5.0V$)

Parameters	Description	Test Conditions	Min	Typ	Max	Units
t_{PLH}	Propagation Delay from R_i to T_i or T_i to R_i Am29861/Am29863 (Noninverting)	$C_L = 50pF$		4.8	6.0	ns
t_{PHL}				5.2	6.2	ns
t_{PLH}		$C_L = 300pF$		8	11	ns
t_{PHL}				11	14	ns
t_{PLH}	Propagation Delay from R_i to $\overline{T}_i$ or $\overline{T}_i$ to R_i Am29862/Am29864 (Inverting)	$C_L = 50pF$		4.0	5.2	ns
t_{PHL}				4.9	5.9	ns
t_{PLH}		$C_L = 300pF$		7.3	10	ns
t_{PHL}				10.5	12.9	ns
t_{ZH}	Output Enable Time $\overline{OET}$ to T_i and $\overline{OER}$ to R_i	$C_L = 50pF$		6.5	12	ns
t_{ZL}				9.5	12	ns
t_{ZH}		$C_L = 300pF$		11	17	ns
t_{ZL}				17	21	ns.
t_{HZ}	Output Disable Time OET to T_i and OER to R_i	$C_L = 5pF$		3.5	8.0	ns
t_{LZ}				3.5	8.0	ns
t_{HZ}		$C_L = 50pF$		11.2	16	ns
t_{LZ}				4.5	9.0	ns

SWITCHING CHARACTERISTICS over operating range unless otherwise specified

Parameters	Description	Test Conditions	COMMERCIAL Min	COMMERCIAL Max	MILITARY Min	MILITARY Max	Units
t_{PLH}	Propagation Delay from R_i to T_i or T_i to R_i Am29861/Am29863 (Noninverting)	$C_L = 50pF$		8		10	ns
t_{PHL}				8		10	ns
t_{PLH}		$C_L = 300pF$		15		17	ns
t_{PHL}				15		17	ns
t_{PLH}	Propagation Delay from R_i to $\overline{T}_i$ or $\overline{T}_i$ to R_i Am29862/Am29864 (Inverting)	$C_L = 50pF$		7.0		9.0	ns
t_{PHL}				7.5		9.5	ns
t_{PLH}		$C_L = 300pF$		14		16	ns
t_{PHL}				14		16	ns
t_{ZH}	Output Enable Time $\overline{OET}$ to T_i or $\overline{OER}$ to R_i	$C_L = 50pF$		15		17	ns
t_{ZL}				15		17	ns
t_{ZH}		$C_L = 300pF$		20		22	ns
t_{ZL}				23		25	ns
t_{HZ}	Output Disable Time $\overline{OET}$ to T_i or $\overline{OER}$ to R_i	$C_L = 5pF$		9		10	ns
t_{LZ}				9		10	ns
t_{HZ}		$C_L = 50pF$		17		19	ns
t_{LZ}				12		12	ns

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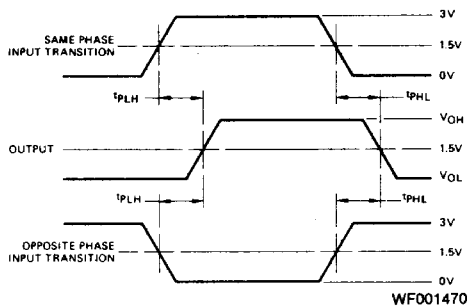
SWITCHING WAVEFORMS

PROPAGATION DELAY



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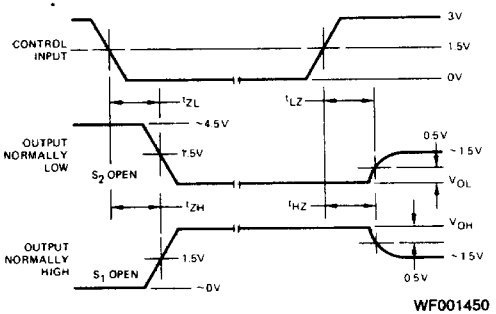
ENABLE AND DISABLE TIMES

Enable Disable



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Notes: 1. Diagram shown for Input Control Enable-LOW and Input Control Disable-HIGH.
2. S_1 and S_2 of Load Circuit are closed except where shown.

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