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July 2016



FIN1002 LVDS 1-Bit, High-Speed Differential Receiver

Features

- Greater than 400 Mbs Data Rate
- 3.3 V Power Supply Operation
- 0.4 ns Maximum Pulse Skew
- 2.5 ns Maximum Propagation Delay
- Bus Pin ESD (HBM) Protection Exceeds 10 kV
- Power-Off, Over-voltage tolerant Input and Output
- Fail-safe Protection for open-circuit and non-driven, shorted, or terminated Conditions
- High-impedance Output at V_{CC} < 1.5 V</p>
- Meets or exceeds TIA/EIA-644 LVDS Standard
- 5-Lead SOT23 Package saves Space

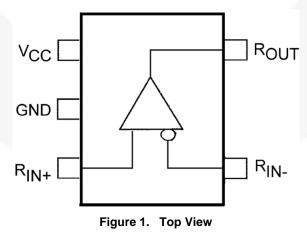
Description

This single receiver is designed for high-speed interconnects utilizing Low Voltage Differential Signaling (LVDS) technology. The receiver translates LVDS levels, with a typical differential input threshold of 100 mV, to LVTTL signal levels. LVDS provides low EMI at ultra low power dissipation even at high frequencies. This device is ideal for high-speed transfer of clock or data. The FIN1002 can be paired with its companion driver, the FIN1001, or with any other LVDS driver.

Ordering Information

Part Number	Operating Temperature Range	Package	Packing Method	Packing Quantity
FIN1002M5	-40 to +125°C	5-Lead SOT23, JEDEC MO-178, 1.6 mm	Tube	250
FIN1002M5X	-40 to +125°C	5-Lead SOT23, JEDEC MO-178, 1.6 mm	Tape & Reel	3000

Connection Diagram



Pin Configuration V_{CC} 1 5 Rout GND 2 4 RIN-Figure 2. Pin Configuration

Pin Definitions

Pin #	Name	Description
1	Vcc	Power Supply
2	GND	Ground for the IC
3	R _{IN+}	Non-inverting Driver Input
4	R _{IN} -	Inverting Driver Input
5	R _{OUT}	LVTTL Data Output

Function Table

Inputs		Outputs
R _{IN+}	R _{out}	
LOW	LOW	
HIGH	LOW	HIGH
Fail-Safe Condition (Ope	HIGH	

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Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter			Min.	Max.	Unit
V _{cc}	Supply Voltage			-0.5	4.6	V
R _{IN+} / R _{IN-}	Input Voltage				4.6	V
D _{OUT}	DC Output Voltage				6.0	V
Ι _ο	Output Current				16	mA
T _{STG}	Storage Temperature Range			-65	+150	°C
TJ	Maximum Junction Temperature				+150	°C
TL	Lead Temperature, Soldering, 10 Seconds				+260	°C
	Electrostatic Discharge	Liuman Dadu Madal	All Pins		8	kV
ESD		Human Body Model	LVDS Pins to GND		10	κV
	Machine Model				400	V

Recommended Operating Conditions

The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. Fairchild does not recommend exceeding them or designing to Absolute Maximum Ratings.

Symbol	Parameter	Min.	Max.	Unit
V _{cc}	Supply Voltage	3.0	3.6	V
V _{IN}	Input Voltage	0	Vcc	V
V _{ID}	Magnitude of Differential Voltage	100	V _{CC}	mV
VIC	Common-mode Input Voltage	$0 + V_{ID} / 2$	2.4 - V _{ID} /2	V
TA	Operating Temperature	-40	+125	°C

DC Electrical Characteristics⁽¹⁾

All min. and max. values are guaranteed at $T_A = -40$ to +125°C. All typical values are at $T_A = 25$ °C and with $V_{CC} = 3.3$ V, unless otherwise specified.

Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
V _{TH}	Differential Input Threshold HIGH	V _{IC} = +0.05 V, 1.2 V, or 2.35 V Figure 3			100	mV
V _{TL}	Differential Input Threshold LOW	V _{IC} = +0.05 V, 1.2 V, or 2.35 V Figure 3	-100			mV
l _{in}	Input Current	$V_{IN} = 0 V \text{ or } V_{CC}$			±20	μA
I _{I(OFF)}	Power-OFF Input Current	$V_{CC} = 0 V, V_{IN} = 0 V \text{ or } 3.6 V$			±20	μA
V _{он}	Output HIGH Voltage	I _{OH} = −100 μA	V _{CC} - 0.2	3.3		V
		I _{OH} = −8 mA	2.4	3.1		
	Output LOW Voltage	I _{OH} = 100 μA	. /	0	0.2	V
V _{OL}		I _{OL} = 8 mA		0.16	0.50	
Vıĸ	Input Clamp Voltage	I _{IK} = −18 mA	-1.5	0.8		V
Icc	Power Supply Current	$(R_{\text{IN+}}=1\ \text{V} \text{ and } R_{\text{IN-}}=1.4\ \text{V}) \text{ or } \\ (R_{\text{IN+}}=1.4\ \text{V} \text{ and } R_{\text{IN-}}=1\ \text{V})$		4	7	mA
CIN	Input Capacitance	V _{CC} = 3.3 V		2.3		pF
COUT	Output Capacitance	$V_{CC} = 0 V$		2.8		pF

Note:

1. Not production tested across the full temperature range.

AC Electrical Characteristics

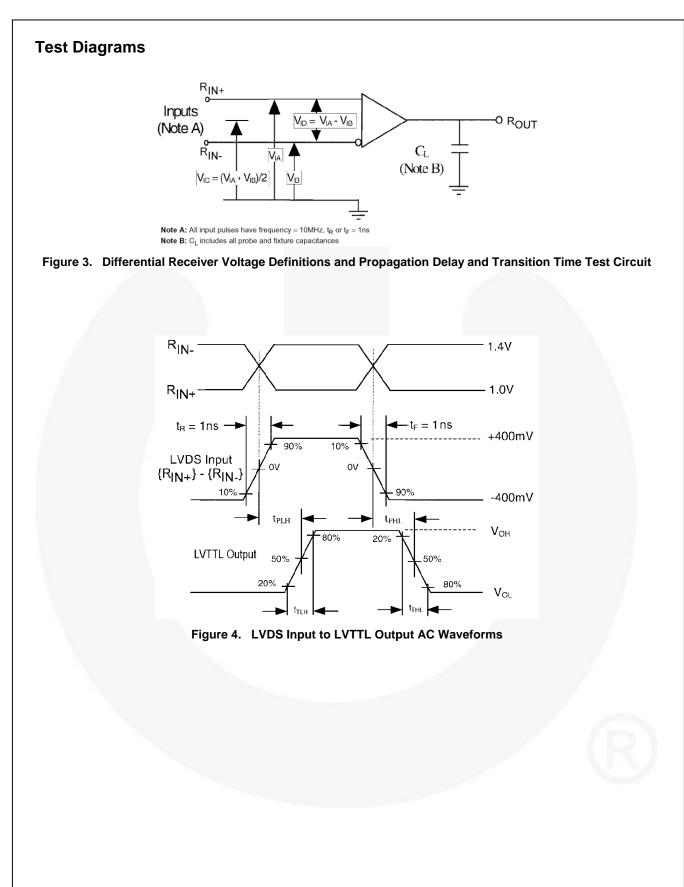
All min. and max. values are guaranteed at $T_A = -40$ to $+85^{\circ}$ C. All typical values are at $T_A = 25^{\circ}$ C and with $V_{CC} = 3.3$ V, unless otherwise specified.

 $|V_{ID}| = 400 \text{ mV}, C_L = 10 \text{ pF}.$ See Figure 3 and Figure 4.

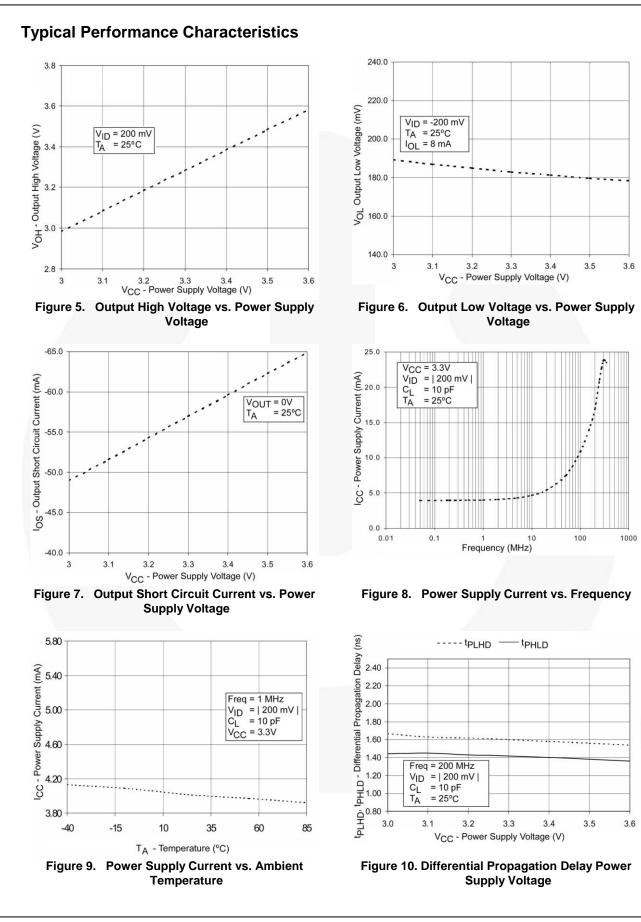
Symbol	Parameter	Conditions	Min.	Тур.	Max.	Units
t _{PLH}	Propagation Delay	LOW to HIGH	0.9	1.5	2.5	ns
t _{PHL}	Propagation Delay	HIGH to LOW	0.9	1.5	2.5	ns
t _{TLH}	Output Rise Time	20% to 80%	1	0.6		ns
t _{THL}	Output Fall Time	80% to 20%		0.5		ns
t _{SK(p)}	Pulse Skew	t _{PLH} - t _{PHL}		0.02	0.4	ns
t _{SK(PP)}	Part-to-Part Skew ⁽²⁾				1.0	ns

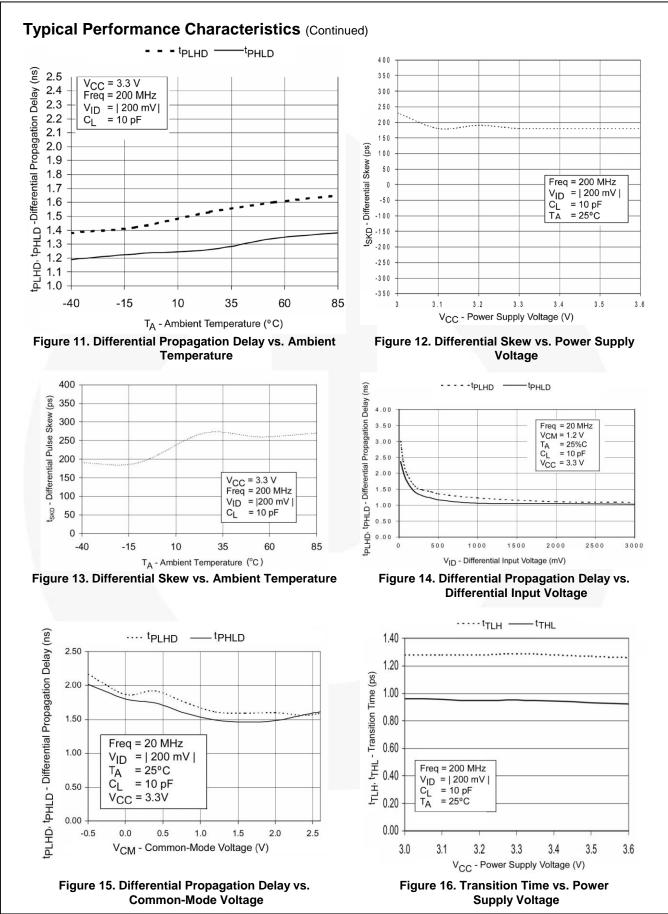
Note:

 t_{SK(PP)} is the magnitude of the difference in propagation delay times between any specified terminals of two devices switching in the same direction (either LOW-to-HIGH or HIGH-to-LOW) when both devices operate with the same supply voltage, same temperature, and have identical test circuits.



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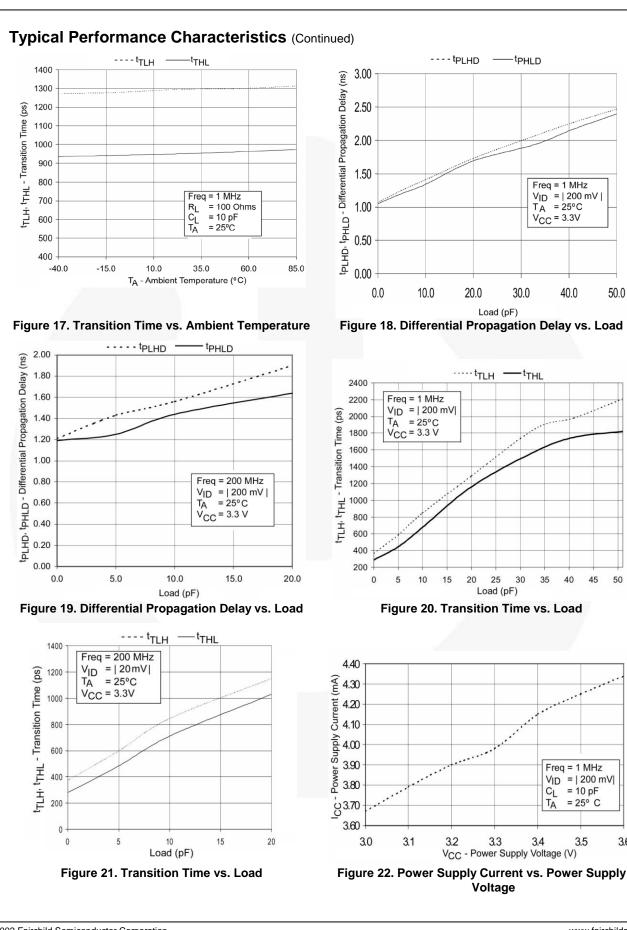


FIN1002 — LVDS 1-Bit, High-Speed Differential Receiver

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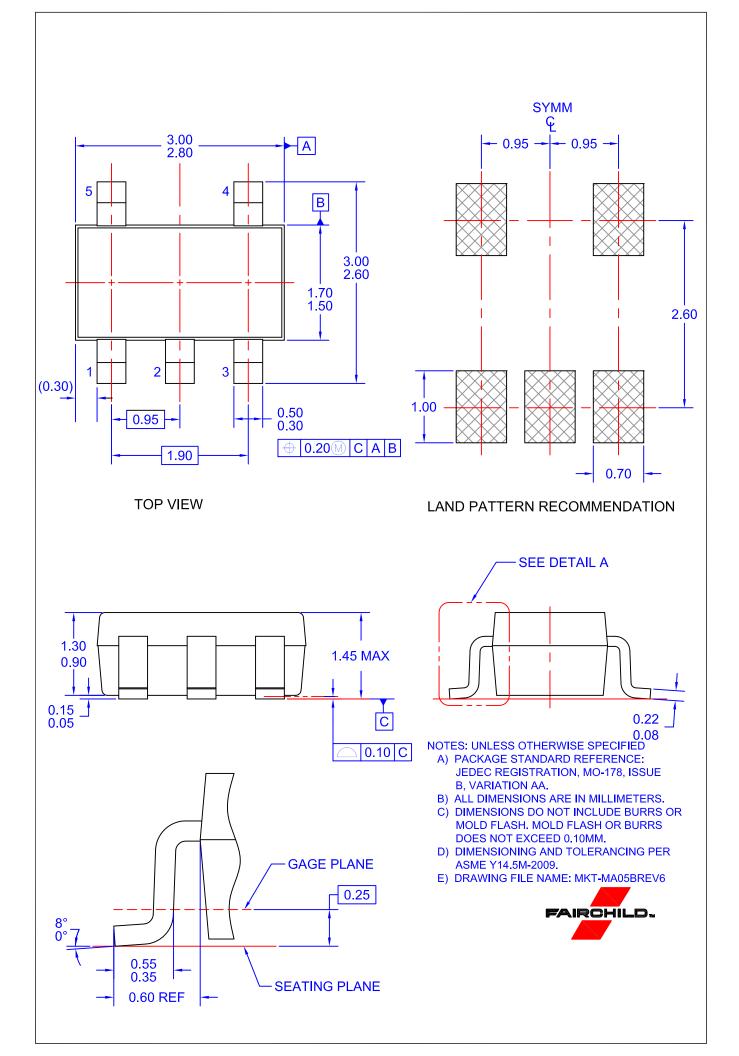
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