# 74LVX161284 Low Voltage IEEE 161284 Translating Transceiver

## **General Description**

FAIRCHILD

SEMICONDUCTOR TM

The LVX161284 contains eight bidirectional data buffers and eleven control/status buffers to implement a full IEEE 1284 compliant interface. The device supports the IEEE 1284 standard and is intended to be used in an Extended Capabilities Port mode (ECP). The pinout allows for easy connection from the Peripheral (A-side) to the Host (cable side).

Outputs on the cable side can be configured to be either open drain or high drive ( $\pm$  14 mA) and are connected to a separate power supply pin (V<sub>CC</sub>-cable) to allow these outputs to be driven by a higher supply voltage than the A-side. The pull-up and pull-down series termination resistance of these outputs on the cable side is optimized to drive an external cable. In addition, all inputs (except HLH) and outputs on the cable side contain internal pull-up resistors connected to the V<sub>CC</sub>-cable supply to provide proper termination and pull-ups for open drain mode.

Outputs on the Peripheral side are standard low-drive CMOS outputs designed to interface with 3V logic. The DIR input controls data flow on the  $A_1-A_8/B_1-B_8$  transceiver pins.

### Features

- Supports IEEE 1284 Level 1 and Level 2 signaling standards for bidirectional parallel communications between personal computers and printing peripherals
- Translation capability allows outputs on the cable side to interface with 5V signals
- All inputs have hysteresis to provide noise margin
- B and Y output resistance optimized to drive external cable
- B and Y outputs in high impedance mode during power down
- Inputs and outputs on cable side have internal pull-up resistors
- Flow-through pin configuration allows easy interface between the "Peripheral and Host"
- Replaces the function of two (2) 74ACT1284 devices

### **Ordering Code**

Order Number	Package Number	Package Description
74LVX161284MEA	MS48A	48-Lead Small Shrink Outline Package (SSOP), JEDEC MO-118, 0.300" Wide
74LVX161284MTD	MTD48	48-Lead Thin Shrink Small Outline Package (TSSOP), JEDEC MO-153, 6.1mm Wide

Device also available in Tape and Reel. Specify by appending suffix letter "X" to the ordering code.

#### Connection Diagram DIR HD 48 Α9 Yg Y<sub>10</sub> A<sub>10</sub> 46 $\begin{array}{c} 1 \\ Y_{11} \\ Y_{12} \\ Y_{12} \\ V_{CC} \ cable \\ 41 \\ 40 \\ 39 \\ B_2 \\ B_3 \\ B_4 \end{array}$ A11 -A1 2 A13 V<sub>CC</sub> A1 A2 GND A3 A4 A5 A6 11 12 13 14 B5 B6 GND B7 36 35 GND A7 A8 15 16 17 18 34 33 32 31 Β, cable v<sub>cc</sub> PLH C14 C15 C16 C17 19 30 PLHin 29 28 A<sub>1</sub>4 20 21 A<sub>15</sub> A<sub>16</sub> A<sub>17</sub> 22 27 23 26 HLE 24 25 HLHin

### **Pin Descriptions**

Pin Names	Description
HD	High Drive Enable Input (Active HIGH)
DIR	Direction Control Input
A <sub>1</sub> –A <sub>8</sub>	Inputs or Outputs
B <sub>1</sub> –B <sub>8</sub>	Inputs or Outputs
A <sub>9</sub> –A <sub>13</sub>	Inputs
Y <sub>9</sub> –Y <sub>13</sub>	Outputs
A <sub>14</sub> –A <sub>17</sub>	Outputs
C <sub>14</sub> –C <sub>17</sub>	Inputs
PLH <sub>IN</sub>	Peripheral Logic HIGH Input
PLH	Peripheral Logic HIGH Output
HLH <sub>IN</sub>	Host Logic HIGH Input
HLH	Host Logic HIGH Output

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Supply VoltageConditions $V_{CC}$ -0.5V to +4.6VSupply Voltage $V_{CC-Cable}$ -0.5V to +7.0V $V_{CC}$ $3.0V$ to $3.6V$ $V_{CC-Cable}$ $3.0V$ to $5.5V$ $V_{CC-Cable}$ $3.0V$ to $5.5V$ $P_{CC-Cable}$ $3.0V$ to $5.5V$ $DC$ Input Voltage $(V_1)$ $0V$ to $V_{CC}$ $A_1-A_{13}, PLH_{N}, DIR, HD-0.5V to V_{CC} + 0.5VDC Input Voltage (V_0)0V to 5.5VB_1-B_8, C_{14}-C_{17}, HLH_{1N}-0.5V to +5.5V (DC)Open Drain Voltage (V_0)0V to 5.5VB_1-B_8, C_{14}-C_{17}, HLH_{1N}-2.0V to +7.0V^*-40^\circC to +85^\circCDutput Voltage (V_0)A_1-A_8, A_{14}-A_{17}, HLH-0.5V to V_{CC} + 0.5VA_1-A_8, A_{14}-A_{17}, HLHDutput Voltage (V_0)A_1-A_8, A_{14}-A_{17}, HLH-0.5V to +5.5V (DC)A_1-A_8, A_{14}-A_{17}, HLHDutput Voltage (V_0)A_1-A_8, A_{14}-A_{17}, HLH-5.5V to +5.5V (DC)A_1-A_8, A_{14}-A_{17}, HLHA_1-A_8, HLH\pm 25 mAA_1-A_9, A_{13}, PLHA_1-A_1, A_1, A_1, A_1, A_1, A_1, A_1, A_1, $	Absolute Maximum Rat	ings(Note 3)	<b>Recommended Operatin</b>	ng
$V_{CC}$ $-0.5V \text{ to } +4.6V$ Supply Voltage $V_{CCCable}$ $-0.5V \text{ to } +7.0V$ $V_{CC}$ $3.0V \text{ to } 3.6V$ $V_{CCCable}$ $3.0V \text{ to } 5.5V$ $V_{CCCable}$ $3.0V \text{ to } 5.5V$ $D_{1-A_13}, PLH_{IN}, DIR, HD$ $-0.5V \text{ to } V_{CC} + 0.5V$ DC Input Voltage $(V_1)$ $0V \text{ to } V_{CC}$ $A_1-A_13, PLH_{IN}, DIR, HD$ $-0.5V \text{ to } +5.5V$ (DC)Operating Temperature $(T_A)$ $-40^\circ \text{C} \text{ to } +85^\circ \text{C}$ $B_1-B_8, C_{14}-C_{17}, HLH_{IN}$ $-2.0V \text{ to } +7.0V^*$ $*40 \text{ ns Transient}$ $-40^\circ \text{C} \text{ to } +85^\circ \text{C}$ Dutput Voltage $(V_0)$ $A_1-A_8, A_{14}-A_{17}, HLH$ $-0.5V \text{ to } V_{CC} + 0.5V$ $Perting Temperature (T_A)$ $-40^\circ \text{C} \text{ to } +85^\circ \text{C}$ $Dutput Voltage (V_0)$ $A_1-A_8, A_{14}-A_{17}, HLH$ $-0.5V \text{ to } +5.5V$ (DC) $Perting Temperature (T_A)$ $-40^\circ \text{C} \text{ to } +85^\circ \text{C}$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-0.5V \text{ to } V_{CC} + 0.5V$ $Perting Temperature (T_A)$ $-40^\circ \text{C} \text{ to } +85^\circ \text{C}$ $A_1-A_8, HLH$ $\pm 25 \text{ mA}$ $440 \text{ ns Transient}$ $40^\circ \text{ so } 17.0V^\circ$ $40^\circ \text{ so } 18.0V^\circ$ $COutput Current (I_0)$ $84 \text{ mA}$ $PLH$ (Output LOW) $84 \text{ mA}$ $PLH$ (Output HIGH) $-50 \text{ mA}$ $PLH$ (Output HIGH) $-50 \text{ mA}$ $PL = 3.280 \text{ mA}$ $PL = 3.280 \text{ mA}$ $PL = 3.280 \text{ mA}$ $Dutput Diode Current (I_{OX})$ $40^\circ \text{ co } 150^\circ \text{ co } 150$	Supply Voltage		Conditions	
$ \begin{array}{ccc} V_{CC-Cable} & -0.5V \mbox{ to } +7.0V & V_{CC} & 3.0V \mbox{ to } 5.5V \\ V_{CC-Cable} & Must \mbox{Be } \geq V_{CC} & & V_{CC-Cable} & 3.0V \mbox{ to } 5.5V \\ nput Voltage (V_i)-(Note 4) & & DC \mbox{ Input Voltage } (V_i) & 0V \mbox{ to } V_{CC} \\ A_1-A_{13}, PLH_{1N}, DIR, HD & -0.5V \mbox{ to } V_{CC} + 0.5V \\ B_1-B_8, C_{14}-C_{17}, HLH_{1N} & -0.5V \mbox{ to } +7.0V \\ & -2.0V \mbox{ to } +7.0V \\ & & & & & & & & & & & & & & & & & & $	V <sub>CC</sub>	-0.5V to +4.6V	Supply Voltage	
$V_{CCCable}$ Must $Be \ge V_{CC}$ $V_{CCCable}$ $3.0V to 5.5V$ nput Voltage $(V_1)$ (Note 4)DC Input Voltage $(V_1)$ $0V to V_{CC}$ $A_1-A_{13}, PLH_{N}, DIR, HD-0.5V to V_{CC} + 0.5VOpen Drain Voltage (V_0)0V to 5.5VB_1-B_8, C_{14}-C_{17}, HLH_{N}-0.5V to +5.5V (DC)Operating Temperature (T_A)-40^\circ C to +85^\circ CB_1-B_8, C_{14}-C_{17}, HLH_{N}-2.0V to +7.0V^**40 ns Transient-40^\circ C to +85^\circ CDutput Voltage (V_0)-2.0V to +7.0V^**40 ns Transient-40^\circ C to +85^\circ CDutput Voltage (V_0)-2.0V to +7.0V^**40 ns Transient-40^\circ C to +85^\circ CDC Output Current (I_0)-2.0V to +7.0V^**40 ns Transient-2.0V to +7.0V^*A_1-A_8, HLH\pm 25 mAB_1-B_8, Y_9-Y_{13}\pm 50 mAPLH (Output LOW)84 mAPLH (Output HIGH)-50 mAPLH (Output HIGH)-50 mA-50 mANote 3: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Fairchild does not recommend operation outside the datbook specifications.DC Continuous V_{CC} or Ground Current (I_{OK})-65^\circ C to +150^\circ CNote 3: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Fairchild does not recommend operation outside the datbook specifications.Note 4: Either voltage limit or current limit is sufficient to protect inputs.$	V <sub>CC—Cable</sub>	-0.5V to +7.0V	V <sub>CC</sub>	3.0V to 3.6V
nput Voltage (V <sub>1</sub> )—(Note 4)DC Input Voltage (V <sub>1</sub> ) $0 \vee to V_{CC}$ A <sub>1</sub> -A <sub>13</sub> , PLH <sub>IN</sub> , DIR, HD $-0.5 \vee to V_{CC} + 0.5 \vee$ Open Drain Voltage (V <sub>0</sub> ) $0 \vee to 5.5 \vee$ B <sub>1</sub> -B <sub>8</sub> , C <sub>14</sub> -C <sub>17</sub> , HLH <sub>IN</sub> $-0.5 \vee to +5.5 \vee$ (DC) $0 \vee to 7.0 \vee^*$ $-40 \degree C to +85 \degree C$ B <sub>1</sub> -B <sub>8</sub> , C <sub>14</sub> -C <sub>17</sub> , HLH <sub>IN</sub> $-2.0 \vee to +7.0 \vee^*$ $*40 \text{ ns Transient}$ $0 \vee to 7.0 \vee^*$ Dutput Voltage (V <sub>0</sub> ) $-2.0 \vee to +7.0 \vee^*$ $*40 \text{ ns Transient}$ $0 \vee to 7.0 \vee^*$ Dutput Voltage (V <sub>0</sub> ) $-2.0 \vee to +5.5 \vee$ (DC) $-3.0 \vee to +5.5 \vee$ (DC) $-3.0 \vee to +5.5 \vee$ (DC)B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> , PLH $-0.5 \vee to +5.5 \vee$ (DC) $-3.0 \vee to +7.0 \vee^*$ $-40 \degree C to +85 \degree C$ DC Output Current (I <sub>0</sub> ) $-4.0 \degree C to +5.5 \vee$ (DC) $-3.0 \vee to +7.0 \vee^*$ $-40 \degree C to +85 \degree C$ A <sub>1</sub> -A <sub>8</sub> , HLH $-2.0 \vee to +7.0 \vee^*$ $-40 \degree C to +85 \degree C$ $-40 \degree C to +85 \degree C$ DC Output Current (I <sub>0</sub> ) $-4.0 \degree C to +5.5 \vee$ (DC) $-40 \degree C to +85 \degree C$ A <sub>1</sub> -A <sub>8</sub> , HLH $-2.0 \vee to +7.0 \vee^*$ $-40 \degree C to +85 \degree C$ DL $-40 \degree C to +5.5 \vee$ (DC) $-50 \degree C to +7.0 \vee^*$ DIR, HD, A <sub>9</sub> -A <sub>13</sub> , PLH, HLH, C <sub>14</sub> -C <sub>17</sub> $-20 \degree A$ Dutput Diode Current (I <sub>0</sub> ) $-50 \degree A$ A <sub>1</sub> -A <sub>8</sub> , A <sub>14</sub> -A <sub>17</sub> , HLH $\pm50 \degree A$ B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> , PLH $-50 \degree A$ Continuous V <sub>CC</sub> or Ground $-65 \degree C to +150 \degree C$ Current $\pm200 \degree A$ Storage Temperature $-65 \degree C to +150 \degree C$ Storage Temperature $-65 \degree C to +150 \degree C$ Storage Temperature $-65 \degree C to +150 \degree C$ Storage Tem	$V_{CC-Cable}$ Must $Be \ge V_{CC}$		V <sub>CC—Cable</sub>	3.0V to 5.5V
$A_1-A_{13}$ , PLH $_{IN}$ , DIR, HD $-0.5V$ to $V_{CC} + 0.5V$ Open Drain Voltage $(V_O)$ $0V$ to $5.5V$ $B_1-B_8$ , $C_{14}-C_{17}$ , HLH $_{IN}$ $-0.5V$ to $+5.5V$ (DC) $0Perating Temperature (T_A)$ $-40^\circ$ C to $+85^\circ$ C $B_1-B_8$ , $C_{14}-C_{17}$ , HLH $_{IN}$ $-2.0V$ to $+7.0V^*$ *40 ns Transient $-40^\circ$ C to $+85^\circ$ C $Dutput Voltage (V_O)$ $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $-0.5V$ to $V_{CC} + 0.5V$ $Perating Temperature (T_A)$ $-40^\circ$ C to $+85^\circ$ C $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $-0.5V$ to $V_{CC} + 0.5V$ $Perating Temperature (T_A)$ $-40^\circ$ C to $+85^\circ$ C $DC$ Output Current (I_O) $A_1-A_8$ , $HLH$ $\pm 25$ mA $A_1-A_8$ , $HLH$ $\pm 25$ mA $B_1-B_8$ , $Y_9-Y_{13}$ $\pm 50$ mA $PLH$ (Output LOW) $84$ mAPLH (Output HIGH) $-50$ mA $-50$ mA $PLH$ (Output HIGH) $-50$ mA $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 50$ mA $PLH$ (Output Diode Current ( $I_{OK}$ ) $-50$ mA $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 50$ mA $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 200$ mA $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $A_20^\circ$ mA $DC$ Continuous $V_{CC}$ or Ground $C_C$ or Ground $C_C$ or Ground $C_C$ math $E_1$ does not recommany trained peration outside the databook specifications.Note 3: Absolute maximum ratings are values beyond which the device may be damaged or have its useful life impaired. Fairchild does not recommany be damaged or have its useful life impaired. Fairchild does not recommany be damaged or have its useful life impaired. Fairchild does not recommany be damaged or have its useful life impaired. Fairchild does not recommany be damaged or have its	Input Voltage (V <sub>I</sub> )—(Note 4)		DC Input Voltage (VI)	0V to V <sub>CC</sub>
$\begin{array}{cccccccccccccccccccccccccccccccccccc$	A <sub>1</sub> –A <sub>13</sub> , PLH <sub>IN</sub> , DIR, HD	–0.5V to V <sub>CC</sub> + 0.5V	Open Drain Voltage (V <sub>O</sub> )	0V to 5.5V
$B_1-B_8$ , $C_{14}-C_{17}$ , $HLH_{1N}$ $-2.0V$ to $+7.0V^*$ *40 ns TransientDutput Voltage (V <sub>O</sub> ) $A_1-A_8$ , $A_{14}-A_{17}$ , $HLH$ $-0.5V$ to $V_{CC}$ +0.5V $A_1-A_8$ , $A_{14}-A_{17}$ , $HLH$ $-0.5V$ to $+5.5V$ (DC) $B_1-B_8$ , $Y_9-Y_{13}$ , PLH $-0.5V$ to $+7.0V^*$ *40 ns TransientDC Output Current (I <sub>O</sub> ) $A_1-A_8$ , $HLH$ $A_1-A_8$ , $HLH$ $\pm 25$ mA $B_1-B_8$ , $Y_9-Y_{13}$ $\pm 50$ mAPLH (Output LOW) $84$ mAPLH (Output HIGH) $-50$ mAnput Diode Current (I <sub>IN</sub> )—(Note 4) $-50$ mADUtput Diode Current (I <sub>OK</sub> ) $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 50$ mA $B_1-B_8$ , $Y_9-Y_{13}$ , PLH $-50$ mA $Dutput Diode Current (IOK)-50 mAA_1-A_8, A_{14}-A_{17}, HLH\pm 50 mAB_1-B_8, Y_9-Y_{13}, PLH-50 mAB_2-B_3, Y_9-Y_{13}, PLH-50 mAB_1-B_8, Y_9-Y_{13}, PLH-50 mAB_1-B_8, Y_9-Y_{13}, PLH-50 mAB_2-B_3, Y_9-Y_{13}, PLH-50 mAB_1-B_8, Y_9-Y_{13}, PLH-50 mA$	B <sub>1</sub> –B <sub>8</sub> , C <sub>14</sub> –C <sub>17</sub> , HLH <sub>IN</sub>	-0.5V to +5.5V (DC)	Operating Temperature (T <sub>A</sub> )	-40°C to +85°C
*40 ns TransientDutput Voltage (V_0) $A_1-A_8, A_{14}-A_{17}, HLH$ $-0.5V$ to $V_{CC} + 0.5V$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-0.5V$ to $+5.5V$ (DC) $B_1-B_8, Y_9-Y_{13}, PLH$ $-2.0V$ to $+7.0V^*$ *40 ns TransientCO Cutput Current (I_0) $A_1-A_8, HLH$ $\pm 25$ mA $B_1-B_8, Y_9-Y_{13}$ $\pm 50$ mAPLH (Output LOW)84 mAPLH (Output HIGH) $-50$ mAnput Diode Current (I_{IK})(Note 4)DIR, HD, $A_9-A_{13}, PLH, HLH, C_{14}-C_{17}$ DIR, HD, $A_9-A_{13}, PLH, HLH, C_{14}-C_{17}$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, Y_9-Y_{13}, PLH$ $A_1-A_8, Y_9-Y_{13}, PLH$ $A_1-A_8, Y_9-Y_{13}, PLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, Y_9-Y_{13}, PLH$ $A_1-A_8, A_{14}-A_{17}, HLH$ $A_1-A_8, Y_9-Y_{13}, PLH$ $A_1-A_17, HLH$ $A_1-A_17, HLH$ $A_1-A_17, HLH$ $A_1-A_17, HLH$ $A_1-A_17, HLH$ $A_1-A_$	B <sub>1</sub> –B <sub>8</sub> , C <sub>14</sub> –C <sub>17</sub> , HLH <sub>IN</sub>	-2.0V to +7.0V*		
Dutput Voltage $(V_0)$ $A_1-A_8, A_{14}-A_{17}, HLH$ $-0.5V$ to $V_{CC} + 0.5V$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-0.5V$ to $+5.5V$ (DC) $B_1-B_8, Y_9-Y_{13}, PLH$ $-2.0V$ to $+7.0V^*$ *40 ns Transient*40 ns TransientDC Output Current (I_0)*4 $A_1-A_8, HLH$ $\pm 25$ mA $B_1-B_8, Y_9-Y_{13}$ $\pm 50$ mAPLH (Output LOW)84 mAPLH (Output HIGH) $-50$ mAnput Diode Current (I_{IK})(Note 4) $-50$ mADIR, HD, $A_9-A_{13}, PLH, HLH, C_{14}-C_{17}$ $-20$ mAOutput Diode Current (I_{OK}) $450$ mA $A_1-A_8, A_{14}-A_{17}, HLH$ $\pm 50$ mA $B_1-B_8, Y_9-Y_{13}, PLH$ $-50$ mAOutput Diode Current (I_{OK}) $450$ mA $A_1-A_8, A_{14}-A_{17}, HLH$ $\pm 50$ mA $B_1-B_8, Y_9-Y_{13}, PLH$ $-50$ mA $B_2-C_8 or Ground$ $\pm 200$ mA $Current$ $\pm 200$ mA $B_2-B_8, Y_9-Y_{13}, PLH$ $-65^\circ$ to $+150^\circ$ C $Storage Temperature$ $-65^\circ$ cto $+150^\circ$ C $Storage Temperature$		*40 ns Transient		
$A_1-A_8, A_{14}-A_{17}, HLH$ $-0.5V to V_{CC} + 0.5V$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-0.5V to +5.5V (DC)$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-2.0V to +7.0V^*$ *40 ns Transient*40 ns TransientDC Output Current (I <sub>0</sub> ) $A_1-A_8, HLH$ $A_1-A_8, HLH$ $\pm 25 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}$ $\pm 50 \text{ mA}$ PLH (Output LOW)84 mAPLH (Output HIGH) $-50 \text{ mA}$ nnput Diode Current (I <sub>10K</sub> ) $-50 \text{ mA}$ DUtput Diode Current (I <sub>10K</sub> ) $-50 \text{ mA}$ $A_1-A_8, A_{14}-A_{17}, HLH$ $\pm 50 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}, PLH, HLH, C_{14}-C_{17}$ $-20 \text{ mA}$ Dutput Diode Current (I <sub>10K</sub> ) $-50 \text{ mA}$ $A_1-A_8, A_{14}-A_{17}, HLH$ $\pm 50 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-50 \text{ mA}$ $DC Continuous V_{CC}$ or Ground $-50 \text{ mA}$ $Current$ $\pm 200 \text{ mA}$ $DC Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $Current$ $\pm 200 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-50 \text{ mA}$ $DC Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C \text{ to } +150^\circ C$ $CU Continuous V_{CC}$ or Ground $-65^\circ C  t$	Output Voltage (V <sub>O</sub> )			
$\begin{array}{ccccccc} B_1-B_8, Y_9-Y_{13}, PLH & -0.5V \ to +5.5V \ (DC) \\ B_1-B_8, Y_9-Y_{13}, PLH & -2.0V \ to +7.0V^* \\ & & & & & & & & & & & & & & & & & & $	A <sub>1</sub> –A <sub>8</sub> , A <sub>14</sub> –A <sub>17</sub> , HLH	–0.5V to V <sub>CC</sub> +0.5V		
$B_1-B_8, Y_9-Y_{13}, PLH$ $-2.0V to +7.0V^*$ *40 ns Transient $DC Output Current (I_0)$ *40 ns Transient $A_1-A_8, HLH$ $\pm 25 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}$ $\pm 50 \text{ mA}$ $PLH (Output LOW)$ 84 mAPLH (Output HIGH) $-50 \text{ mA}$ nput Diode Current (I_{IK})(Note 4) $-50 \text{ mA}$ DIR, HD, $A_9-A_{13}, PLH, HLH, C_{14}-C_{17}$ $-20 \text{ mA}$ Output Diode Current (I_{OK}) $\pm 50 \text{ mA}$ $A_1-A_8, A_{14}-A_{17}, HLH$ $\pm 50 \text{ mA}$ $B_1-B_8, Y_9-Y_{13}, PLH$ $-50 \text{ mA}$ $DC Continuous V_{CC} or GroundCurrent\pm 200 \text{ mA}DC Continuous V_{CC} or GroundCurrent\pm 200 \text{ mA}A_{1-A_8, A_{14}-A_{17}, HLH\pm 50 \text{ mA}B_1-B_8, Y_9-Y_{13}, PLH-50 \text{ mA}DC Continuous V_{CC} or GroundCurrent\pm 200 \text{ mA}DC Continuous V_{CC} or GroundCurrent\pm 200 \text{ mA}B_1-B_8, Y_9-Y_{13}, PLH-50 \text{ mA}DC Continuous V_{CC} or GroundCurrent\pm 200 \text{ mA}DC Continuous V_{CC} or GroundCurrent\pm 100 \text{ mA}$	B <sub>1</sub> –B <sub>8</sub> , Y <sub>9</sub> –Y <sub>13</sub> , PLH	-0.5V to +5.5V (DC)		
*40 ns TransientCO Cutput Current (I_0) $A_1-A_8$ , HLH $\pm 25 \text{ mA}$ $B_1-B_8$ , $Y_9-Y_{13}$ $\pm 50 \text{ mA}$ PLH (Output LOW) $84 \text{ mA}$ PLH (Output HGH) $-50 \text{ mA}$ nput Diode Current (I_{IK})—(Note 4) $-50 \text{ mA}$ DIR, HD, $A_9-A_{13}$ , PLH, HLH, $C_{14}-C_{17}$ $-20 \text{ mA}$ Nutput Diode Current (I_{OK}) $41-A_8$ , $A_{14}-A_{17}$ , HLH $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 50 \text{ mA}$ $B_1-B_8$ , $Y_9-Y_{13}$ , PLH $-50 \text{ mA}$ OC Continuous $V_{CC}$ or Ground Current $\pm 200 \text{ mA}$ Charge Temperature $\pm 200 \text{ mA}$ Storage Temperature $-65^{\circ}$ C to $\pm 150^{\circ}$ CStorage Temperature $2000V$	B <sub>1</sub> –B <sub>8</sub> , Y <sub>9</sub> –Y <sub>13</sub> , PLH	-2.0V to +7.0V*		
DC Output Current (I_0) $\pm 25 \text{ mA}$ $A_1-A_8$ , HLH $\pm 25 \text{ mA}$ $B_1-B_8$ , $Y_9-Y_{13}$ $\pm 50 \text{ mA}$ PLH (Output LOW) $84 \text{ mA}$ PLH (Output HIGH) $-50 \text{ mA}$ PLH (Output HIGH) $-50 \text{ mA}$ DIR, HD, $A_9-A_{13}$ , PLH, HLH, $C_{14}-C_{17}$ $-20 \text{ mA}$ Dutput Diode Current (I_{I_K})(Note 4) $-20 \text{ mA}$ DIR, HD, $A_9-A_{13}$ , PLH, HLH, $C_{14}-C_{17}$ $-20 \text{ mA}$ Output Diode Current (I_{OK}) $-50 \text{ mA}$ $A_1-A_8$ , $A_{14}-A_{17}$ , HLH $\pm 50 \text{ mA}$ $B_1-B_8$ , $Y_9-Y_{13}$ , PLH $-50 \text{ mA}$ OC Continuous $V_{CC}$ or Ground Current $\pm 200 \text{ mA}$ Cotage Temperature $\pm 200 \text{ mA}$ Storage Temperature $-65^{\circ}$ C to $+150^{\circ}$ CSSD (HBM) Last Passing Voltage $2000V$		*40 ns Transient		
$\begin{array}{cccc} A_1-A_8, \ HLH & \pm 25 \ mA \\ B_1-B_8, \ Y_9-Y_{13} & \pm 50 \ mA \\ PLH (Output LOW) & 84 \ mA \\ PLH (Output HIGH) & -50 \ mA \\ nput Diode Current (I_{IIK})(Note 4) \\ DIR, \ HD, \ A_9-A_{13}, \ PLH, \ HLH, \ C_{14}-C_{17} & -20 \ mA \\ Output Diode Current (I_{OK}) & & & & & & & & & & & & & & & & & & &$	DC Output Current (I <sub>O</sub> )			
$\begin{array}{ccccccc} B_1-B_8, \ Y_9-Y_{13} & \pm 50 \ \text{mA} \\ PLH \ (\text{Output LOW}) & 84 \ \text{mA} \\ PLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ PLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ pLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ pLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ pLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ pLH \ (\text{Output HGH}) & -50 \ \text{mA} \\ pLH \ (\text{A}_{3}-A_{13}, \text{PLH}, \text{HLH}, \ C_{14}-C_{17} & -20 \ \text{mA} \\ pLH \ (\text{A}_{1}-A_{8}, A_{14}-A_{17}, \text{HLH} & \pm 50 \ \text{mA} \\ B_{1}-B_{8}, \ Y_{9}-Y_{13}, \text{PLH} & -50 \ \text{mA} \\ pC \ \text{Continuous } V_{CC} \ \text{or Ground} \\ Current & \pm 200 \ \text{mA} \\ pL20 \ \text{mA} \\ pL200 \ \text{mA} \ pL200 \ $	A <sub>1</sub> –A <sub>8</sub> , HLH	±25 mA		
PLH (Output LOW)   84 mA     PLH (Output HIGH)   -50 mA     nput Diode Current (I <sub>IK</sub> )—(Note 4)   -20 mA     DIR, HD, Ag-A <sub>13</sub> , PLH, HLH, C <sub>14</sub> -C <sub>17</sub> -20 mA     Output Diode Current (I <sub>OK</sub> )   -50 mA     A <sub>1</sub> -A <sub>8</sub> , A <sub>14</sub> -A <sub>17</sub> , HLH   ±50 mA     B <sub>1</sub> -B <sub>8</sub> , Yg-Y <sub>13</sub> , PLH   -50 mA     OC Continuous V <sub>CC</sub> or Ground Current   ±200 mA     Storage Temperature   -65°C to +150°C     SSD (HBM) Last Passing Voltage   2000V	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	±50 mA		
PLH (Output HIGH) -50 mA   nput Diode Current (I <sub>IK</sub> )—(Note 4) -20 mA   DIR, HD, Ag-A <sub>13</sub> , PLH, HLH, C <sub>14</sub> -C <sub>17</sub> -20 mA   Dutput Diode Current (I <sub>OK</sub> ) -50 mA   A <sub>1</sub> -A <sub>8</sub> , A <sub>14</sub> -A <sub>17</sub> , HLH ±50 mA   B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> , PLH -50 mA   OC Continuous V <sub>CC</sub> or Ground Current -50 mA   Storage Temperature -65°C to +150°C   SSD (HBM) Last Passing Voltage 2000V	PLH (Output LOW)	84 mA		
nput Diode Current (I <sub>IK</sub> )—(Note 4) DIR, HD, Ag-A13, PLH, HLH, C14-C17 $-20 \text{ mA}$ Dutput Diode Current (I <sub>OK</sub> ) $\pm 50 \text{ mA}$ A1-A8, A14-A17, HLH $\pm 50 \text{ mA}$ B1-B8, Y9-Y13, PLH $-50 \text{ mA}$ OC Continuous V <sub>CC</sub> or Ground Current $\pm 200 \text{ mA}$ Storage Temperature $-65^{\circ}$ C to $\pm 150^{\circ}$ CStorage Temperature $-65^{\circ}$ C to $\pm 150^{\circ}$ CStorage Temperature $2000V$	PLH (Output HIGH)	–50 mA		
Dutput Diode Current (I <sub>OK</sub> )     A1-A8, A14-A17, HLH   ±50 mA     B1-B8, Y9-Y13, PLH   -50 mA     OC Continuous V <sub>CC</sub> or Ground Current   -50 mA     Storage Temperature   -65°C to +150°C     SSD (HBM) Last Passing Voltage   2000V	Input Diode Current (I <sub>IK</sub> )—(Note 4) DIR, HD, A <sub>9</sub> –A <sub>13</sub> , PLH, HLH, C <sub>14</sub> –C <sub>17</sub>	–20 mA		
A1-A8, A14-A17, HLH ±50 mA   B1-B8, Y9-Y13, PLH -50 mA   OC Continuous V <sub>CC</sub> or Ground Current -50 mA   Storage Temperature -65°C to +150°C   CSD (HBM) Last Passing Voltage 2000V	Output Diode Current (I <sub>OK</sub> )			
B1-B8, Y9-Y13, PLH -50 mA   OC Continuous V <sub>CC</sub> or Ground Current ±200 mA   Storage Temperature -65°C to +150°C   CSD (HBM) Last Passing Voltage 2000V	A <sub>1</sub> -A <sub>8</sub> , A <sub>14</sub> -A <sub>17</sub> , HLH	±50 mA		
DC Continuous V <sub>CC</sub> or Ground Current may be damaged or have its useful life impaired. Fairchild does not recommend operation outside the databook specifications.   Storage Temperature -65°C to +150°C   Storage Temperature 2000V	B <sub>1</sub> –B <sub>8</sub> , Y <sub>9</sub> –Y <sub>13</sub> , PLH	–50 mA	Note 3: Absolute maximum ratings are values b	evond which the device
Note 4: Either voltage limit or current limit is sufficient to protect inputs.   ESD (HBM) Last Passing Voltage 2000V	DC Continuous V <sub>CC</sub> or Ground Current	±200 mA	may be damaged or have its useful life impaired. F mend operation outside the databook specification	airchild does not recom- s.
ESD (HBM) Last Passing Voltage 2000V	Storage Temperature	-65°C to +150°C	Note 4: Either voltage limit or current limit is sufficient	ent to protect inputs.
	ESD (HBM) Last Passing Voltage	2000V		

## **DC Electrical Characteristics**

					$\mathbf{T}_{\mathbf{A}} = 0^{\circ}\mathbf{C}$	$T_A = -40^\circ C$			
Symbol	Parameter		V <sub>CC</sub>	V <sub>CC—Cable</sub> (V)	to +70°C	to +85°C	Units	Conditions	
				(-)	Guaranteed Limits				
V <sub>IK</sub>	Input Clamp		3.0	3.0	-1.2	-1.2	V	I <sub>i</sub> = -18 mA	
	Diode Voltage								
VIH	Minimum	A <sub>n</sub> , B <sub>n</sub> , PLH <sub>IN</sub> , DIR, HD	3.0-3.6	3.0-5.5	2.0	2.0			
	HIGH Level	C <sub>n</sub>	3.0-3.6	3.0–5.5	2.3	2.3	V		
	Input Voltage	HLH <sub>IN</sub>	3.0-3.6	3.0-5.5	2.6	2.6			
VIL	Maximum	A <sub>n</sub> , B <sub>n</sub> , PLH <sub>IN</sub> , DIR, HD	3.0-3.6	3.0-5.5	0.8	0.8			
	LOW Level	C <sub>n</sub>	3.0-3.6	3.0-5.5	0.8	0.8	V		
	Input Voltage	HLH <sub>IN</sub>	3.0-3.6	3.0-5.5	1.6	1.6			
$\Delta V_T$	Minimum Input	A <sub>n</sub> , B <sub>n</sub> , PLH <sub>IN</sub> , DIR, HD	3.3	5.0	0.4	0.4		V <sub>T</sub> <sup>+</sup> -V <sub>T</sub>	
	Hysteresis	C <sub>n</sub>	3.3	5.0	0.8	0.8	V	$V_{T}^{+}-V_{T}^{-}$	
		HLH <sub>IN</sub>	3.3	5.0	0.2	0.2		V <sub>T</sub> <sup>+</sup> -V <sub>T</sub> <sup>-</sup>	
V <sub>OH</sub>	Minimum HIGH	A <sub>n</sub> , HLH	3.0	3.0	2.8	2.8		I <sub>OH</sub> = -50 μA	
	Level Output		3.0	3.0	2.4	2.4		$I_{OH} = -4 \text{ mA}$	
	Voltage	B <sub>n</sub> , Y <sub>n</sub>	3.0	3.0	2.0	2.0	V	I <sub>OH</sub> = -14 mA	
		B <sub>n</sub> , Y <sub>n</sub>	3.0	4.5	2.23	2.23		I <sub>OH</sub> = -14 mA	
		PLH	3.15	3.15	3.1	3.1		I <sub>OH</sub> = -500 μA	
	•	•				•	·		

Symbol V <sub>OL</sub> Maximu Level O Voltage R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista II <sub>I</sub> Maximu Resista II <sub>I</sub> Maximu Current HIGH S II <sub>L</sub> Maximu Current LOW Si IoZH Maximu Disable (HIGH) IoZL Maximu Output I Current IoFF Power I Output I	P num LOW Output ge num Output dance num Output dance num Pull-Up tance	An, HLH Bn, Yn Bn, Yn PLH PLH B1-B8, Y9-Y13 B1-B8, Y9-Y13 B1-B8, Y9-Y13,	(V) 3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.0	CC—Cable       3.0       3.0       3.0       3.0       4.5       3.0       4.5       3.0       4.5       3.0       4.5       3.3       5.0	to +70°C Guarante 0.2 0.4 0.8 0.77 0.85 0.8 60 55	to +85°C 0.2 0.4 0.8 0.77 0.95 0.9 60	V	Conditi $I_{OL} = 50 \ \mu \lambda$ $I_{OL} = 4 \ mA$ $I_{OL} = 14 \ m$ $I_{OL} = 14 \ m$ $I_{OL} = 84 \ mA$
V <sub>OL</sub> Maximu Level O Voltage   R <sub>D</sub> Maximu Impeda   Minimu Impeda Minimu Impeda   R <sub>P</sub> Maximu Resista   I <sub>II</sub> Maximu Resista   I <sub>II</sub> Maximu Current HIGH S   I <sub>IL</sub> Maximu Current LOW Si   I <sub>OZH</sub> Maximu Disable (HIGH)   I <sub>OZL</sub> Maximu Output I Current   I <sub>OFF</sub> Power I Output I	num LOW Output ge num Output dance num Output dance num Pull-Up tance	A <sub>n</sub> , HLH B <sub>n</sub> , Y <sub>n</sub> B <sub>n</sub> , Y <sub>n</sub> PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.3 3.3 3.3	3.0 3.0 3.0 4.5 3.0 4.5 3.3 5.0	Guarante       0.2       0.4       0.8       0.77       0.85       0.8       60       55	0.2       0.4       0.8       0.77       0.95       0.9       60	- V	$I_{OL} = 50 \ \mu A$ $I_{OL} = 4 \ mA$ $I_{OL} = 14 \ m.$ $I_{OL} = 14 \ m.$ $I_{OL} = 84 \ m.$
V <sub>OL</sub> Maximu Level O Voltage R <sub>D</sub> Maximu Impeda Minimu Impeda Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Resista Minimu Current LOW SI IozL Maximu Disable (HIGH) IozL Maximu Disable (HIGH)	num LOW Output ge num Output dance num Output dance num Pull-Up tance	A <sub>n</sub> , HLH B <sub>n</sub> , Y <sub>n</sub> B <sub>n</sub> , Y <sub>n</sub> PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.0 3.0 3.0 3.0 3.0 3.0 3.0 3.3 3.3 3.3	3.0 3.0 3.0 4.5 3.0 4.5 3.3 5.0	0.2 0.4 0.8 0.77 0.85 0.8 60 55	0.2 0.4 0.8 0.77 0.95 0.9 60	v	$I_{OL} = 50 \ \mu A$ $I_{OL} = 4 \ m A$ $I_{OL} = 14 \ m.$ $I_{OL} = 14 \ m.$ $I_{OL} = 84 \ m.$
R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Disable (HIGH)	Output ge num Output dance num Output dance num Pull-Up tance num Pull-1 n	B <sub>n</sub> , Y <sub>n</sub> B <sub>n</sub> , Y <sub>n</sub> PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> ,	3.0 3.0 3.0 3.0 3.0 3.0 3.3 3.3 3.3 3.3	3.0 3.0 4.5 3.0 4.5 3.3 5.0	0.4 0.8 0.77 0.85 0.8 60 55	0.4 0.8 0.77 0.95 0.9 60	- V - V	$I_{OL} = 4 \text{ mA}$ $I_{OL} = 14 \text{ m}$ $I_{OL} = 14 \text{ m}$ $I_{OL} = 84 \text{ m}$
R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Disable (HIGH)	num Output dance num Output dance num Pull-Up tance num Pull-Up	B <sub>n</sub> , Y <sub>n</sub> B <sub>n</sub> , Y <sub>n</sub> PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> ,	3.0 3.0 3.0 3.3 3.3 3.3 3.3 3.3	3.0 4.5 3.0 4.5 3.3 5.0	0.8 0.77 0.85 0.8 60 55	0.8 0.77 0.95 0.9 60	- V	$I_{OL} = 14 \text{ m/}$ $I_{OL} = 14 \text{ m/}$ $I_{OL} = 84 \text{ m/}$
R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Disable (HIGH) IoZL Maximu Disable (HIGH) IoZL Output I Current	num Output dance num Output dance num Pull-Up tance num Pull-Un	B <sub>n</sub> , Y <sub>n</sub> PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.0 3.0 3.3 3.3 3.3 3.3 3.3	4.5 3.0 4.5 3.3 5.0	0.77 0.85 0.8 60 55	0.77 0.95 0.9 60		I <sub>OL</sub> = 14 m/ I <sub>OL</sub> = 84 m/
R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Disable (HIGH)	num Output dance num Output dance num Pull-Up tance num Pull-Un	PLH PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.0 3.0 3.3 3.3 3.3 3.3 3.3	3.0 4.5 3.3 5.0	0.85 0.8 60 55	0.95 0.9 60		I <sub>OL</sub> = 84 m/
R <sub>D</sub> R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista Minimu Resista IIIH Maximu Current HIGH S IIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Disable (HIGH) IOZL Output I Current	num Output dance hum Output dance num Pull-Up tance	PLH B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.0 3.3 3.3 3.3 3.3	4.5 3.3 5.0	0.8 60 55	0.9 60		1 04
R <sub>D</sub> Maximu Impeda Minimu Impeda R <sub>P</sub> Maximu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Disable (HIGH) IoZL Maximu Disable (HIGH) IoZL Maximu Disable (HIGH)	num Output dance dance num Output dance num Pull-Up tance	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> ,	3.3 3.3 3.3 3.3	3.3 5.0	60 55	60		$I_{OL} = 84 \text{ m/}$
Impeda Minimu Impeda Rp Resista Minimu Resista IIIH Maximu Current HIGH S IIL Maximu Current HIGH S IIL Maximu Current HIGH S IIL IOZH Maximu Current LOW SI IIL IOZH Naximu Disable (HIGH) IOZL Output I Current IOFF Power I Output I	dance hum Output dance num Pull-Up tance	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> ,	3.3 3.3 3.3	5.0	55			(Note 5)(No
IIL Maximu Disable (HIGH) IOZL Output I Output I Output I Output I	um Output dance num Pull-Up tance	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13,</sub>	3.3 3.3		00	55	0	(14010-0)(140
Impeda Rp Maximu Resista Minimu Resista IIH Maximu Current HIGH S IIL Maximu Current LOW St IOZH Maximu Disable (HIGH) IOZL Maximu Output I Current IOFF Power I	dance num Pull-Up tance num Pull-Up	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13,</sub>	3.3	3.3	30	30	52	(Noto 5)/No
R <sub>P</sub> Maximu Resista Minimu Resista I <sub>IH</sub> Maximu Current HIGH S I <sub>IL</sub> Maximu Current LOW SI I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output I Current	num Pull-Up tance num Pull-Up	B <sub>1</sub> –B <sub>8</sub> , Y <sub>9</sub> –Y <sub>13,</sub>	0.0	5.0	35	35		(14018-3)(140
IIII Maximu Current HIGH S IIII Maximu Current HIGH S IIII Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Output I Current IOFF Power I	tance		3.3	3.3	1650	1650	0	
IIII Maximu Resista IIII Maximu Current HIGH S IIIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Output I Current IOFF Power I	um Pull-Un	C <sub>14</sub> –C <sub>17</sub>	3.3	5.0	1650	1650	52	
IIII Maximu Current HIGH S IIIL Maximu Current LOW SI IOZH Maximu Disable (HIGH) IOZL Maximu Output I Current IOFF Power I	OP	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	3.3	3.3	1150	1150	0	
I <sub>IH</sub> Maximu Current HIGH S I <sub>IL</sub> Maximu Current LOW St I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output I Current I <sub>OFF</sub> Power I	tance	C <sub>14</sub> -C <sub>17</sub>	3.3	5.0	1150	1150	52	
I <sub>IL</sub> Maximu Current LOW SI I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output I <sub>OFF</sub> Power I Output	num Input	A <sub>9</sub> –A <sub>13</sub> , PLH <sub>IN</sub> ,	3.6	3.6	1.0	1.0		$V_I = 3.6V$
IIL Maximu Current LOW Si IOZH Maximu Disable (HIGH) IOZL Maximu Output IOFF Power I	nt in	HD, DIR, HLH <sub>IN</sub>					•	
I <sub>IL</sub> Maximu Current LOW SI I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I	State	C <sub>14</sub> -C <sub>17</sub>	3.6	3.6	50.0	50.0	μΑ	$V_I = 3.6V$
I <sub>IL</sub> Maximu Current LOW SI I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I		C <sub>14</sub> -C <sub>17</sub>	3.6	5.5	100	100		$V_I = 5.5V$
I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I Output	num Input	A <sub>9</sub> –A <sub>13</sub> , PLH <sub>IN</sub> ,	3.6	3.6	-1.0	-1.0	μA	$V_I = 0.0V$
I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I	nt in	HD, DIR, HLH <sub>IN</sub>						
I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I	State	C <sub>14</sub> -C <sub>17</sub>	3.6	3.6	-3.5	-3.5	mA	$V_I = 0.0V$
I <sub>OZH</sub> Maximu Disable (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I		C <sub>14</sub> -C <sub>17</sub>	3.6	5.5	-5.0	-5.0	mA	$V_I = 0.0V$
I <sub>OZL</sub> Disable (HIGH) U <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I	num Output	A <sub>1</sub> -A <sub>8</sub>	3.6	3.6	20	20	μΑ	V <sub>O</sub> = 3.6V
I <sub>OZL</sub> (HIGH) I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I Output	le Current	B <sub>1</sub> -B <sub>8</sub>	3.6	3.6	50	50	μA	V <sub>O</sub> = 3.6V
I <sub>OZL</sub> Maximu Output Current I <sub>OFF</sub> Power I	H)	B <sub>1</sub> -B <sub>8</sub>	3.6	5.5	100	100	μA	V <sub>O</sub> = 5.5V
Output Current I <sub>OFF</sub> Power I	num	A <sub>1</sub> -A <sub>8</sub>	3.6	3.6	-20	-20	μA	$V_{0} = 0.0V$
Current	ut Disable	B <sub>1</sub> -B <sub>8</sub>	3.6	3.6	-3.5	-3.5	mA	
I <sub>OFF</sub> Power I	nt (LOW)	B <sub>1</sub> -B <sub>8</sub>	3.6	5.5	-5.0	-5.0	mA	
Output	r Down	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub> ,						
Output	ut Leakage	PLH	0.0	0.0	100	100	μA	V <sub>O</sub> = 5.5V
I <sub>OFF</sub> Power [	r Down							
Input Le	Leakage	$C_{14}-C_{17}$ , HLH <sub>IN</sub>	0.0	0.0	100	100	μA	V <sub>I</sub> = 5.5V
I <sub>OFF-ICC</sub> Power [	r Down							
Leakag	age to V <sub>CC</sub>		0.0	0.0	250	250	μA	(Note 6)
IOFF_ICC2 Power [	r Down Leakage	e		1				
to Vec	0		0.0	0.0	250	250	μA	(Note 6)

Note 5: Output impedance is measured with the output active LOW and active HIGH (HD = HIGH).

Note 6: Power-down leakage to  $V_{CC}$  or  $V_{CC-Cable}$  is tested by simultaneously forcing all pins on the cable-side (B<sub>1</sub>–B<sub>8</sub>, Y<sub>9</sub>–Y<sub>13</sub>, PLH, C<sub>14</sub>–C<sub>17</sub> and HLH<sub>IN</sub>) to 5.5V and measuring the resulting I<sub>CC</sub> or I<sub>CC-Cable</sub>.

Note 7: This parameter is guaranteed but not tested, characterized only.

		T <sub>A</sub> = 0°C to +70°C		T <sub>A</sub> = -40°			
		$V_{CC} = 3$	.0V–3.6V	V <sub>CC</sub> = 3		Figure	
Symbol	Parameter	V <sub>CC—Cable</sub> = 3.0V–5.5V		V <sub>CC—Cable</sub>	Units	Number	
	-	Min	Max	Min	Max		
PHL	A <sub>1</sub> -A <sub>8</sub> to B <sub>1</sub> -B <sub>8</sub>	2.0	40.0	2.0	44.0	ns	Figure 1
PLH	A <sub>1</sub> -A <sub>8</sub> to B <sub>1</sub> -B <sub>8</sub>	2.0	40.0	2.0	44.0	ns	Figure 2
PHL	B <sub>1</sub> -B <sub>8</sub> to A <sub>1</sub> -A <sub>8</sub>	2.0	40.0	2.0	44.0	ns	Figure 3
PLH	B <sub>1</sub> -B <sub>8</sub> to A <sub>1</sub> -A <sub>8</sub>	2.0	40.0	2.0	44.0	ns	Figure 3
PHL	A <sub>9</sub> -A <sub>13</sub> to Y <sub>9</sub> -Y <sub>13</sub>	2.0	40.0	2.0	44.0	ns	Figure 1
PLH	A <sub>9</sub> -A <sub>13</sub> to Y <sub>9</sub> -Y <sub>13</sub>	2.0	40.0	2.0	44.0	ns	Figure 2
PHL	C <sub>14</sub> -C <sub>17</sub> to A <sub>14</sub> -A <sub>17</sub>	2.0	40.0	2.0	44.0	ns	Figure 3
PLH	C <sub>14</sub> -C <sub>17</sub> to A <sub>14</sub> -A <sub>17</sub>	2.0	40.0	2.0	44.0	ns	Figure 3
SKEW	LH-LH or HL-HL		10.0		12.0	ns	(Note 9)
PHL	PLH <sub>IN</sub> to PLH	2.0	40.0	2.0	44.0	ns	Figure 1
PLH	PLH <sub>IN</sub> to PLH	2.0	40.0	2.0	44.0	ns	Figure 2
PHL	HLH <sub>IN</sub> to HLH	2.0	40.0	2.0	44.0	ns	Figure 3
PLH	HLH <sub>IN</sub> to HLH	2.0	40.0	2.0	44.0	ns	Figure 3
PHZ	Output Disable Time	2.0	15.0	2.0	18.0		Figure 7
PLZ	DIR to A1-A8	2.0	15.0	2.0	18.0	115	Figure /
PZH	Output Enable Time	2.0	50.0	2.0	50.0		Figure 9
PZL	DIR to A1-A8	2.0	50.0	2.0	50.0	ns	Figure 8
PHZ	Output Disable Time	2.0	50.0	2.0	50.0		Figure 0
PLZ	DIR to B <sub>1</sub> -B <sub>8</sub>	2.0	50.0	2.0	50.0	ns	Figure 9
pEN	Output Enable Time	2.0	25.0	2.0	28.0		Figure 0
	HD to B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	2.0	25.0	2.0	28.0	ns	rigule 2
DIS	Output Disable Time	2.0	25.0	2.0	28.0	-	Figure 2
	HD to B1-B8, Y9-Y13	2.0	25.0	2.0	28.0	115	Figure 2
pEN <sup>—t</sup> pDIS	Output Enable-		10.0		12.0	ns	
	Output Disable						
SLEW	Output Slew Rate						
PLH	B <sub>1</sub> -B <sub>8</sub> , Y <sub>9</sub> -Y <sub>13</sub>	0.05	0.40	0.05	0.40	V/ns	Figure 5
PHL		0.05	0.40	0.05	0.40		Figure 4
, t <sub>f</sub>	t <sub>RISE</sub> and t <sub>FALL</sub>		120		120		Figure 6
	B <sub>1</sub> -B <sub>8</sub> (Note 8),		120		120	ns	(Note 10)

Note 9: t<sub>SKEW</sub> is measured for common edge output transitions and compares the measured propagation delay for a given path type:

(i)  $\mathsf{A}_1\text{--}\mathsf{A}_8$  to  $\mathsf{B}_1\text{--}\mathsf{B}_8,\,\mathsf{A}_9\text{--}\mathsf{A}_{13}$  to  $\mathsf{Y}_9\text{--}\mathsf{Y}_{13}$ 

(ii)  $B_1 - B_8$  to  $A_1 - A_8$ 

(iii) C<sub>14</sub>-C<sub>17</sub> to A<sub>14</sub>-A<sub>17</sub>

Note 10: This parameter is guaranteed but not tested, characterized only.

## Capacitance

Symbol	Parameter	Тур	Units	Conditions			
C <sub>IN</sub>	Input Capacitance	3	pF	$V_{CC} = 0.0V$ (HD, DIR, A <sub>9</sub> –A <sub>13</sub> , C <sub>14</sub> –C <sub>17</sub> , PLH <sub>IN</sub> and HLH <sub>IN</sub> )			
C <sub>I/O</sub> (Note 11)	I/O Pin Capacitance	5	pF	$V_{CC} = 3.3V$			
Note 11: C is measured at frequency 1 MHz nor MIL STD 992P. Method 2012							

ured at frequency = 1 MHz, per MIL-STD-883B, Method 3012 -i/O



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