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FXLH42245

Low-Voltage, Dual-Supply, 8-Bit, Signal Translator with Configurable Voltage Supplies, Bushold Data Inputs, 3-State Outputs and 26Ω Series Resistors in the B-Port Outputs

Features

- Bi-Directional Interface between Two Levels from 1.1V to 3.6V
- Fully Configurable, Inputs Track V_{CC} Level
- Non-Preferential Power-up; Either V_{CC} May Be Powered-up First
- Outputs Remain in 3-State until Active V_{CC} Level is Reached
- Outputs Switch to 3-State if Either V_{CC} is at GND
- Bushold on Data Inputs Eliminates the need for External Pull-Up / Pull-Down Resistors
- 26W Output Series Resistors on the B Port to Reduce Line Noise
- Power-Off Protection
- Control Inputs ($\overline{T/R}$, \overline{OE}) Levels are Referenced To V_{CCA} Voltage
- Packaged in 24-Pin MLP
- ESD Protection Exceeds:
 - 4kV Human Body Model (per JESD22-A114 & Mil Std 883e 3015.7)
 - 8kV Human Body Model I/O to GND (per JESD22-A114 & Mil Std 883e 3015.7)
 - 1kV Charge Device Model (per ESD STM 5.3)
 - 200V Machine Model (per JESD22-A115 & ESD STM5.2)

Description

The FXLH42245 is a configurable dual-voltage-supply translator designed for bi-directional voltage translation of signals between two voltage levels. The device allows translation between voltages as high as 3.6V to as low as 1.1V. The A port tracks the V_{CCA} level and the B port tracks the V_{CCB} level. Both ports are designed to accept supply voltage levels from 1.1V to 3.6V. This allows for bi-directional voltage translation over a variety of voltage levels: 1.2V, 1.5V, 1.8V, 2.5V, and 3.3V.

The device remains in 3-state until both V_{CCs} reach active levels, allowing either V_{CC} to be powered-up first. The device also contains power-down control circuits that place the device in 3-state if either V_{CC} is removed.

The Transmit/Receive ($\overline{T/R}$) input determines the direction of data flow through the device. The \overline{OE} input, when HIGH, disables both the A and B ports by placing them in a 3-state condition. The FXLH42245 is designed with the control pins ($\overline{T/R}$ and OE) supplied by V_{CCA}.

Ordering Information

Part Number	 Eco Status	Package	Packing Method
FXLH42245MPX	Green	24-Pin Molded Leadless Package (MLP), JEDEC MO-220, 3.5 x 4.5mm	Tape and Reel

 For Fairchild's definition of Eco Status, please visit: http://www.fairchildsemi.com/company/green/rohs_green.html.

Pin Configuration

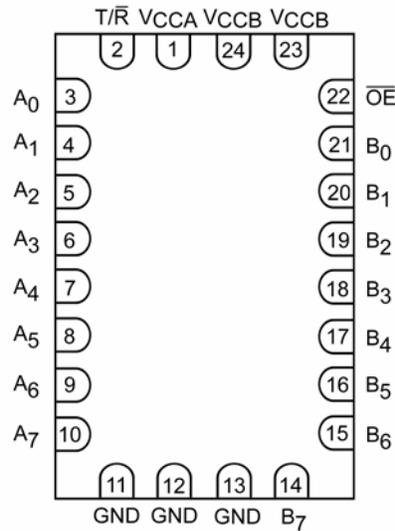


Figure 1. Pin Configuration (Top Through View)

Pin Definitions

Pin #	Name	Description
1	V _{CCA}	Side-A Power Supply
2	$\overline{T/R}$	Transmit / Receive Input
3, 4, 5, 6, 7, 8, 9, 10	A ₀ , A ₁ , A ₂ , A ₃ , A ₄ , A ₅ , A ₆ , A ₇	Side-A Inputs or 3-State Outputs
11, 12, 13	GND	Ground
14, 15, 16, 17, 18, 19, 20, 21	B ₇ , B ₆ , B ₅ , B ₄ , B ₃ , B ₂ , B ₁ , B ₀	Side-B Inputs or 3-State Outputs
22	\overline{OE}	Output Enable Input
23, 24	V _{CCB}	Side-B Power Supply

Truth Table

Inputs		Description
\overline{OE}	$\overline{T/R}$	
LOW Voltage Level	LOW Voltage Level	Bus B Data to Bus A
LOW Voltage Level	HIGH Voltage Level	Bus A Data to Bus B
HIGH Voltage Level	Don't Care	3-State

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	Conditions	Min.	Max.	Unit
V_{CCA}	Supply Voltage		-0.5	4.6	V
V_{CCB}			-0.5	4.6	
V_I	DC Input Voltage	I/O Port A	-0.5 to V_{CCA}	0.5	V
		I/O Port B	-0.5 to V_{CCB}	0.5	
		Control Inputs ($\overline{T/R}$, \overline{OE})	-0.5	0.5	
V_O	Output Voltage ⁽¹⁾	Output 3-State	-0.5	4.6	V
		Output Active (A_n)	-0.5 to V_{CCA}	0.5	
		Output Active (B_n)	-0.5 to V_{CCB}	0.5	
I_{IK}	DC Input Diode Current	$V_I < 0V$		-50	mA
I_{OK}	DC Output Diode Current	$V_O < 0V$		-50	mA
		$V_O > V_{CC}$		50	
I_{OH}/I_{OL}	DC Output Source/Sink Current			± 50	mA
I_{CC}	DC V_{CC} or Ground Current per Supply Pin			± 100	mA
T_{STG}	Storage Temperature Range		-65	+150	$^{\circ}C$
ESD	Electrostatic Discharge Capability	Human Body Model, JESD22-A114, Mil Std 883e 3015.7	I/O to GND	4	kV
				8	
		Charged Device Model, JESD22-C101, STM 5.3		1	V
		Machine Model, JESD22-A115, STM 5.2		200	

Note:

1. I/O absolute maximum ratings must be observed.

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	Conditions	Min.	Max.	Unit	
V_{CC}	Power Supply	Operating V_{CCA} or V_{CCB}	1.1	3.6	V	
V_I	Input Voltage	Port A	0	V_{CCA}	V	
		Port B	0	V_{CCB}		
		Control Inputs ($\overline{T/R}$, \overline{OE})	0	V_{CCA}		
I_{OH}/I_{OL}	Output Current	Port A V_{CCA}	3.0V to 3.6V		± 24	mA
			2.3V to 2.7V		± 18	
			1.65V to 1.95V		± 6	
			1.40V to 1.65V		± 2	
			1.1V to 1.4V		± 0.5	
		Port B V_{CCB} Resistor Outputs	3.0V to 3.6V		± 14	
			2.3V to 2.7V		± 8	
			1.65V to 1.95V		± 3	
			1.40V to 1.65V		± 1	
			1.1V to 1.4V		± 0.25	
T_A	Operating Temperature, Free Air		-40	+85	$^{\circ}C$	
$\Delta V/\Delta t$	Minimum Input Edge Rate	$V_{CCA/B} = 1.1V$ to 3.6V		10	ns/V	

Note:

2. All unused inputs must be held at V_{CCI} or GND.

Electrical Characteristics

Symbol	Parameter	Conditions	V _{CCI} (V)	V _{CC0} (V)	Min.	Max.	Units
V _{IH}	HIGH Level Input ⁽³⁾	Data Inputs A _n , B _n	2.70 to 3.60	1.1 to 3.6	2.0		V
			2.30 to 2.70		1.6		
			1.65 to 2.30		0.65 x V _{CCI}		
			1.40 to 1.65		0.65 x V _{CCI}		
			1.10 to 1.40		0.9 x V _{CCI}		
		Control Pins \overline{OE} , $\overline{T/R}$ (Referenced to V _{CCA})	2.70 to 3.6	1.1 to 3.6	2.0		
			2.30 to 2.70		1.6		
			1.65 to 2.30		0.65 x V _{CCA}		
			1.40 to 1.65		0.65 x V _{CCA}		
			1.10 to 1.40		0.9 x V _{CCA}		
V _{IL}	LOW Level Input ⁽³⁾	Data Inputs A _n , B _n	2.70 to 3.60	1.1 to 3.6		0.8	V
			2.30 to 2.70			0.7	
			1.65 to 2.30			0.35 x V _{CCI}	
			1.40 to 1.65			0.35 x V _{CCI}	
			1.10 to 1.40			0.10 x V _{CCI}	
		Control Pins \overline{OE} , $\overline{T/R}$ (Referenced to V _{CCA})	2.70 to 3.60	1.1 to 3.6		0.8	
			2.30 to 2.70			0.7	
			1.65 to 2.30			0.35 x V _{CCA}	
			1.40 to 1.65			0.35 x V _{CCA}	
			1.10 to 1.40			0.10 x V _{CCA}	
V _{OH}	HIGH Level Output ⁽⁴⁾ B Port	I _{OH} = -100μA	1.1 to 3.6	1.1 to 3.6	V _{CC0} to 0.2		V
		I _{OH} = -6mA	2.7	2.7	2.2		
		I _{OH} = -8mA	3.0	3.0	2.4		
		I _{OH} = -12mA	3.0	3.0	2.2		
		I _{OH} = -4mA	2.3	2.3	2.0		
		I _{OH} = -6mA	2.3	2.3	1.8		
		I _{OH} = -8mA	2.3	2.3	1.7		
		I _{OH} = -3mA	1.65	1.65	1.25		
		I _{OH} = -1mA	1.4	1.4	1.05		
		I _{OH} = -0.25mA	1.1	1.1	0.75 x V _{CC0}		
	HIGH Level Output ⁽⁴⁾ A Port	I _{OH} = -100μA	1.1 to 3.6	1.1 to 3.6	V _{CC0} to 0.2		
		I _{OH} = -12mA	2.7	2.7	2.2		
		I _{OH} = -18mA	3.0	3.0	2.4		
		I _{OH} = -24mA	3.0	3.0	2.2		
		I _{OH} = -6mA	2.3	2.3	2.0		
		I _{OH} = -12mA	2.3	2.3	1.8		
		I _{OH} = -18mA	2.3	2.3	1.7		
		I _{OH} = -6mA	1.65	1.65	1.25		
		I _{OH} = -2mA	1.4	1.4	1.05		
		I _{OH} = -0.5mA	1.1	1.1	0.75 x V _{CC0}		

Continued on the following page

Electrical Characteristics (Continued)

Symbol	Parameter	Conditions	V _{CCI} (V)	V _{CCO} (V)	Min.	Max.	Units
V _{OL}	LOW Level Output ⁽⁴⁾ B Port	I _{OL} = 100μA	1.1 to 3.6	1.1 to 3.6		0.2	V
		I _{OL} = 6mA	2.7	2.7		0.4	
		I _{OL} = 8mA	3.0	3.0		0.55	
		I _{OL} = 12mA	3.0	3.0		0.80	
		I _{OL} = 6mA	2.3	2.3		0.4	
		I _{OL} = 8mA	2.3	2.3		0.6	
		I _{OL} = 3mA	1.65	1.65		0.3	
		I _{OL} = 1mA	1.4	1.4		0.35	
		I _{OL} = 0.25mA	1.1	1.1		0.3 x V _{CCO}	
	LOW Level Output ⁽⁴⁾ A Port	I _{OL} = 100μA	1.1 to 3.6	1.1 to 3.6		0.2	
		I _{OL} = 12mA	2.7	2.7		0.4	
		I _{OL} = 18mA	3.0	3.0		0.4	
		I _{OL} = 24mA	3.0	3.0		0.55	
		I _{OL} = 12mA	2.3	2.3		0.4	
		I _{OL} = 18mA	2.3	2.3		0.6	
		I _{OL} = 6mA	1.65	1.65		0.3	
		I _{OL} = 2mA	1.4	1.4		0.35	
		I _{OL} = 0.5mA	1.1	1.1		0.3 x V _{CCO}	
I _L	Input Leakage Current, Control Pins	V _I =V _{CCA} or GND	1.1 to 3.6	3.6		±1.0	μA
I _{I(HOLD)}	Bushold Input Minimum Drive Current	V _{IN} =0.8	3.0	3.0	75		μA
		V _{IN} =2.0	3.0	3.0	-75		
		V _{IN} =0.7	2.3	2.3	45		
		V _{IN} =1.6	2.3	2.3	-45		
		V _{IN} =0.57	1.65	1.65	25		
		V _{IN} =10.7	1.65	1.65	-25		
		V _{IN} =0.49	1.4	1.4	11		
		V _{IN} =0.91	1.4	1.4	-11		
		V _{IN} =0.11	1.1	1.1	4		
		V _{IN} =0.99	1.1	1.1	-4		
I _{I(OD)}	Bushold Input Over-Drive Current-to-Current State	Note 5	3.6	3.6	450		μA
		Note 6	3.6	3.6	-450		
		Note 5	2.7	2.7	300		
		Note 6	2.7	2.7	-300		
		Note 5	1.95	1.95	200		
		Note 6	1.95	1.95	-200		
		Note 5	1.6	1.6	120		
		Note 6	1.6	1.6	-120		
		Note 5	1.4	1.4	80		
		Note 6	1.4	1.4	-80		

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Electrical Characteristics (Continued)

Symbol	Parameter	Conditions	V _{CCI} (V)	V _{CCO} (V)	Min.	Max.	Units
I _{OFF}	Power Off Leakage Current	A _n , V _I or V _O =0V to 3.6V	0	3.6		±10	μA
		B _n , V _I or V _O =0V to 3.6V	3.6	0		±10	
I _{OZ}	3-State Output Leakage (V _O , V _{CC} or GND V _I =V _{IH} or V _{IL})	A _n , B _n , \overline{OE} =V _{IH}	3.6	3.6		±10	μA
		B _n , \overline{OE} = Don't Care ⁽⁷⁾	0	3.6		±10	
		A _n , \overline{OE} = Don't Care ⁽⁷⁾	3.6	0		±10	
I _{CCA/B}	Quiescent Supply Current ⁽⁸⁾	V _I =V _{CCI} or GND; I _O =0	1.1 to 3.6	1.1 to 3.6		20	μA
I _{CCZ}			1.1 to 3.6	1.1 to 3.6		20	
I _{CCA}		V _I =V _{CCA} or GND; I _O =0	0	1.1 to 3.6		-10	
			1.1 to 3.6	0		10	
I _{CCB}		V _I =V _{CCB} or GND; I _O =0	1.1 to 3.6	0		-10	
			0	1.1 to 3.6		10	
ΔI _{CCA/B}	Increase in I _{CC} per Input; Other Inputs at V _{CC} or GND	V _{IH} =3.0	3.6	3.6		500	μA

Notes:

3. V_{CCI} = the V_{CC} associated with the data input under test.
4. V_{CCO} = the V_{CC} associated with the output under test.
5. An external driver must source at least the specified current to switch LOW-to-HIGH.
6. An external driver must source at least the specified current to switch HIGH-to-LOW.
7. Don't care = any valid logic level.
8. Reflects current per supply, V_{CCA} or V_{CCB}.

AC Electrical Characteristics

$V_{CCA}=3.0V$ to $3.6V$

Symbol	Parameter	$T_A = -40$ to $+85^\circ C$										Units
		$V_{CCB}=3.0V$ to $3.6V$		$V_{CCB}=2.3V$ to $2.7V$		$V_{CCB}=1.65V$ to $1.95V$		$V_{CCB}=1.4V$ to $1.6V$		$V_{CCB}=1.1V$ to $1.3V$		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH}, t_{PHL}	Propagation Delay A to B	0.5	3.9	0.5	4.5	0.9	5.9	1.0	7.4	1.6	22.0	ns
	Propagation Delay B to A	0.2	3.5	0.2	3.8	0.3	4.0	0.5	4.3	0.8	13.0	
t_{PZH}, t_{PZL}	Output Enable \overline{OE} to B	0.7	4.8	0.1	5.1	1.5	6.7	1.5	7.1	2.0	18.0	ns
	Output Enable \overline{OE} to A	0.5	4.0	0.5	4.0	0.5	4.0	0.5	4.0	0.5	4.0	
t_{PHZ}, t_{PLZ}	Output Disable \overline{OE} to B	0.4	4.3	0.4	4.4	0.9	5.2	1.7	6.8	2.0	19.0	ns
	Output Disable \overline{OE} to A	0.2	3.7	0.2	3.7	0.2	3.7	0.2	3.7	0.2	3.7	

$V_{CCA}=2.3V$ to $2.7V$

Symbol	Parameter	$T_A = -40$ to $+85^\circ C$										Units
		$V_{CCB}=3.0V$ to $3.6V$		$V_{CCB}=2.3V$ to $2.7V$		$V_{CCB}=1.65V$ to $1.95V$		$V_{CCB}=1.4V$ to $1.6V$		$V_{CCB}=1.1V$ to $1.3V$		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH}, t_{PHL}	Propagation Delay A to B	0.5	4.3	0.6	4.8	0.9	6.0	1.0	7.6	1.6	22.0	ns
	Propagation Delay B to A	0.3	3.9	0.4	4.2	0.5	4.5	0.5	4.8	1.0	7.0	
t_{PZH}, t_{PZL}	Output Enable \overline{OE} to B	0.8	5.1	1.0	5.5	1.5	6.9	1.5	7.4	2.0	19.0	ns
	Output Enable \overline{OE} to A	0.6	4.5	0.6	4.5	0.6	4.5	0.6	4.5	0.6	4.5	
t_{PHZ}, t_{PLZ}	Output Disable \overline{OE} to B	0.4	4.6	0.4	4.8	0.9	5.3	1.7	7.1	2.0	19.0	ns
	Output Disable \overline{OE} to A	0.2	4.0	0.2	4.0	0.2	4.0	0.2	4.0	0.2	4.0	

$V_{CCA}=1.65V$ to $1.95V$

Symbol	Parameter	$T_A = -40$ to $+85^\circ C$										Units
		$V_{CCB}=3.0V$ to $3.6V$		$V_{CCB}=2.3V$ to $2.7V$		$V_{CCB}=1.65V$ to $1.95V$		$V_{CCB}=1.4V$ to $1.6V$		$V_{CCB}=1.1V$ to $1.3V$		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH}, t_{PHL}	Propagation Delay A to B	0.5	4.6	0.7	5.1	1.1	6.2	1.1	7.8	1.7	22.0	ns
	Propagation Delay B to A	0.5	5.4	0.5	5.6	0.8	5.7	1.0	6.0	1.2	8.0	
t_{PZH}, t_{PZL}	Output Enable \overline{OE} to B	0.8	5.4	1.0	5.9	1.5	7.3	1.5	7.7	2.0	20.0	ns
	Output Enable \overline{OE} to A	1.0	6.7	1.0	6.7	1.0	6.7	1.0	6.7	1.0	6.7	
t_{PHZ}, t_{PLZ}	Output Disable \overline{OE} to B	0.4	4.7	0.4	4.9	1.0	5.4	1.7	7.2	2.0	19.0	ns
	Output Disable \overline{OE} to A	0.5	5.0	0.5	5.0	0.5	5.0	0.5	5.0	0.5	5.0	

AC Electrical Characteristics (Continued)

 $V_{CCA}=1.4V$ to $1.6V$

Symbol	Parameter	$T_A = -40$ to $+85^\circ\text{C}$										Units
		$V_{CCB}=3.0V$ to $3.6V$		$V_{CCB}=2.3V$ to $2.7V$		$V_{CCB}=1.65V$ to $1.95V$		$V_{CCB}=1.4V$ to $1.6V$		$V_{CCB}=1.1V$ to $1.3V$		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH}, t_{PHL}	Propagation Delay A to B	0.7	4.8	0.8	5.3	1.2	6.4	1.3	7.9	2.0	22.0	ns
	Propagation Delay B to A	0.6	6.8	0.8	6.9	0.9	7.1	1.0	7.3	1.3	9.5	
t_{PZH}, t_{PZL}	Output Enable OE to B	1.1	5.8	1.3	6.3	1.5	7.8	2.0	8.1	2.0	20.0	ns
	Output Enable OE to A	1.0	7.5	1.0	7.5	1.0	7.5	1.0	7.5	1.0	7.5	
t_{PHZ}, t_{PLZ}	Output Disable OE to B	0.6	4.8	0.6	5.1	1.1	5.8	2.0	7.7	2.0	18.0	ns
	Output Disable OE to A	1.0	6.0	1.0	6.0	1.0	6.0	1.0	6.0	1.0	6.0	

 $V_{CCA}=1.1V$ to $1.3V$

Symbol	Parameter	$T_A = -40$ to $+85^\circ\text{C}$										Units
		$V_{CCB}=3.0V$ to $3.6V$		$V_{CCB}=2.3V$ to $2.7V$		$V_{CCB}=1.65V$ to $1.95V$		$V_{CCB}=1.4V$ to $1.6V$		$V_{CCB}=1.1V$ to $1.3V$		
		Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	
t_{PLH}, t_{PHL}	Propagation Delay A to B	1.0	13.8	1.0	7.8	1.0	8.4	1.0	10.4	2.0	24.0	ns
	Propagation Delay B to A	1.4	22.0	1.4	22.0	1.5	22.0	1.5	22.0	2.0	24.0	
t_{PZH}, t_{PZL}	Output Enable OE to B	1.5	12.6	1.5	9.6	1.5	10.6	2.0	11.6	2.0	24.0	ns
	Output Enable OE to A	2.0	22.0	2.0	22.0	2.0	22.0	2.0	22.0	2.0	22.0	
t_{PHZ}, t_{PLZ}	Output Disable OE to B	1.2	15.0	0.9	7.6	1.2	8.6	2.0	10.6	3.0	21.0	ns
	Output Disable OE to A	2.0	15.0	2.0	12.0	2.0	12.0	2.0	12.0	2.0	12.0	

Capacitance

Symbol	Parameter	Conditions	$T_A = +25^\circ\text{C}$	Units
			Typical	
C_{IN}	Input Capacitance Control Pins (OE, T/R)	$V_{CCA}=V_{CCB}=3.3V, V_I=0V$ or $V_{CCA/B}$	4	pF
$C_{I/O}$	Input/Output Capacitance A_n, B_n Port	$V_{CCA}=V_{CCB}=3.3V, V_I=0V$ or $V_{CCA/B}$	5	pF
C_{PD}	Power Dissipation Capacitance	$V_{CCA}=V_{CCB}=3.3V, V_I=0V$ or $V_{CC}, f=10\text{MHz}$	20	pF

AC Loadings and Waveforms

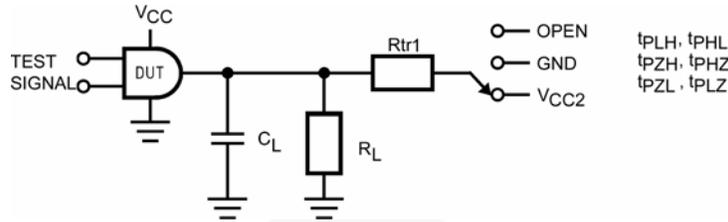
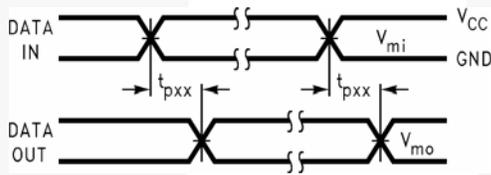


Figure 2. AC Test Circuit

Test	Switch
t_{PLH}, t_{PHL}	Open
t_{PLZ}, t_{PZL}	$V_{CC0} \cdot 2$ at $V_{CC0}=3.3 \pm 0.3V, 2.5V \pm 0.2V, 1.8V \pm 0.15V, 1.5V \pm 0.1V, 1.2V \pm 0.1V$
t_{PHZ}, t_{PZH}	GND

Table 1. AC Load Table

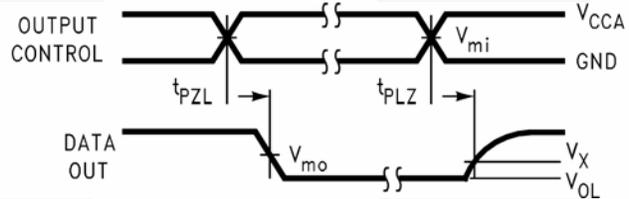
V_{CC0}	C_L	R_L	R_{tr1}
$1.2V \pm 0.1V$	15pF	2k Ω	2k Ω
$1.5V \pm 0.1V$	15pF	2k Ω	2k Ω
$1.8V \pm 0.15V$	30pF	500 Ω	500 Ω
$2.5V \pm 0.2V$	30pF	500 Ω	500 Ω
$3.3V \pm 0.3V$	30pF	500 Ω	500 Ω



Note:

9. Input $t_R=t_F=2.0ns$, 10% to 90%

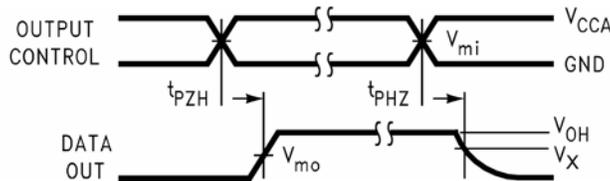
Figure 3. Waveform for Inverting and Non-Inverting Functions



Note:

10. Input $t_R=t_F=2.0ns$, 10% to 90%

Figure 4. 3-State Output High Enable and Disable for Low Voltage Logic



Note:

11. Input $t_R=t_F=2.0ns$, 10% to 90%

Figure 5. 3-State Output High Enable and Disable for Low Voltage Logic

Symbol	V_{CC}				
	$3.3V \pm 0.3V$	$2.5V \pm 0.2V$	$1.8V \pm 0.15V$	$1.5V \pm 0.1V$	$1.2V \pm 0.1V$
V_{MI}	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$	$V_{CC}/2$
V_{MO}	$V_{CC0}/2$	$V_{CC0}/2$	$V_{CC0}/2$	$V_{CC0}/2$	$V_{CC0}/2$
V_X	$V_{OH} - 0.3V$	$V_{OH} - 0.15V$	$V_{OH} - 0.15V$	$V_{OH} - 0.1V$	$V_{OH} - 0.1V$
V_Y	$V_{OL} + 0.3V$	$V_{OL} + 0.15V$	$V_{OL} + 0.15V$	$V_{OL} + 0.1V$	$V_{OL} + 0.1V$

Note:

12. For V_{MI} $V_{CC0}=V_{CCA}$ for control pins T/\bar{R} and $\bar{O}E$ or $V_{CC}/2$.

Functional Description

Power-Up/Power-Down Sequencing

FXL translators offer an advantage in that either V_{CC} may be powered up first. This benefit derives from the chip design. When either V_{CC} is at 0V, outputs are in a High-impedance state. The control inputs ($\overline{T/R}$ and \overline{OE}) are designed to track the V_{CCA} supply. A pull-up resistor tying \overline{OE} to V_{CCA} should be used to ensure that bus contention, excessive currents, or oscillations do not occur during power-up/power-down. The size of the pull-up resistor is based upon the current-sinking capability of the OE driver.

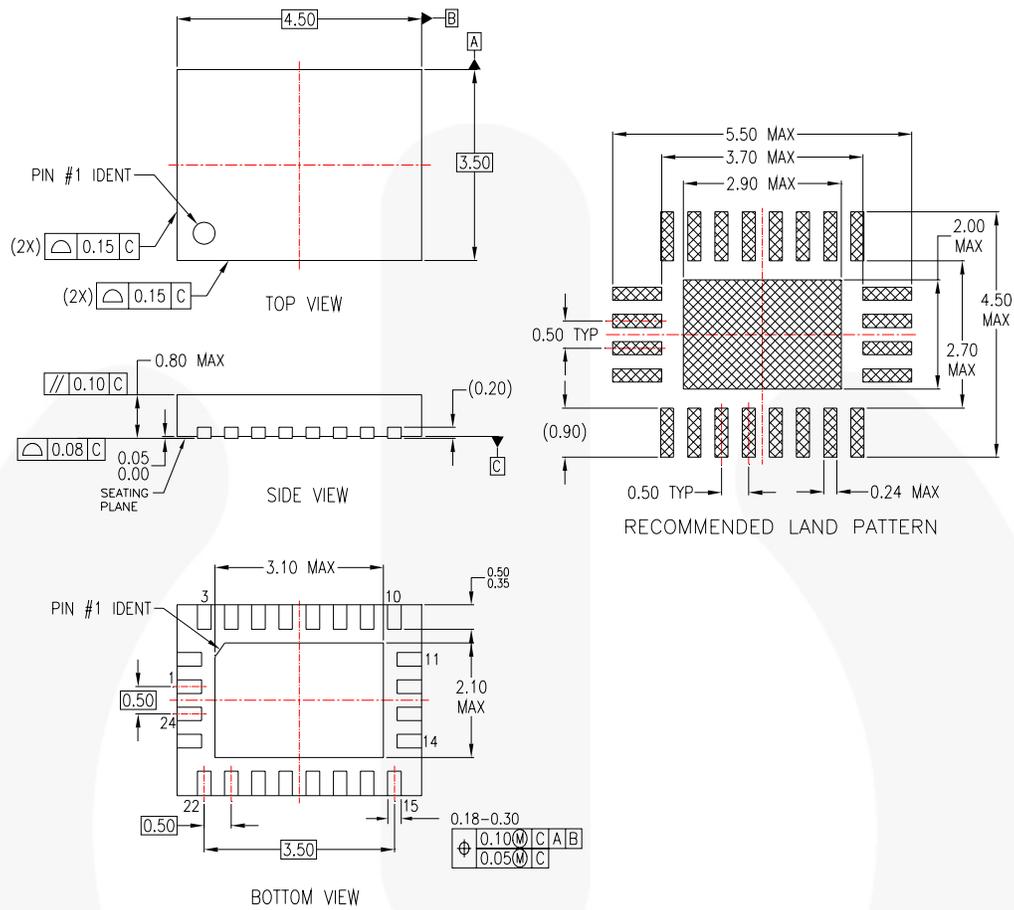
The recommended power-up sequence is:

1. Apply power to either V_{CC} .
2. Apply power to the $\overline{T/R}$ input (logic HIGH for A-to-B operation; logic LOW for B-to-A operation) and to the respective data inputs (A port or B port). This may occur at the same time as step 1.
3. Apply power to the other V_{CC} .
4. Drive the \overline{OE} input LOW to enable the device.

The recommended power-down sequence is:

1. Drive \overline{OE} input HIGH to disable the device.
2. Remove power from either V_{CC} .
3. Remove power from the other V_{CC} .

Physical Dimensions



NOTES:

- A. CONFORMS TO JEDEC REGISTRATION MO-220, VARIATION WFS-2 FOR DIMENSIONS ONLY. PIN NUMBERING DOES NOT COMPLY.
- B. DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS AND TOLERANCES PER ASME Y14.5M, 1994

MLP24Brev4

Figure 6. 24-Pin Molded Leadless Package (MLP), JEDEC MO-220, 3.5 x 4.5mm

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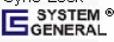
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