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# **FXL2SD106**

## **Low-Voltage Dual-Supply 6-Bit Voltage Translator with Auto-Direction Sensing**

### **Features**





## 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	Rating
$V_{CCA}, V_{CCB}$	Supply Voltage	-0.5V to +4.6V
$V_I$	DC Input Voltage	-0.5V to +4.6V
	I/O Port A	-0.5V to +4.6V
	I/O Port B	-0.5V to +4.6V
	OE, CLK IN	-0.5V to +4.6V
$V_O$	Output Voltage <sup>(1)</sup>	-0.5V to +4.6V
	Outputs 3-STATE	-0.5V to +4.6V
	Outputs Active ( $A_n$ )	-0.5V to $V_{CCA} + 0.5V$
	Outputs Active ( $B_n$ , CLK OUT)	-0.5V to $V_{CCB} + 0.5V$
$I_{IK}$	DC Input Diode Current at $V_I = 0V$	-50mA
$I_{OK}$	DC Output Diode Current at	
	$V_O = 0V$	-50mA
	$V_O = V_{CC}$	+50mA
$I_{OH}/I_{OL}$	DC Output Source/Sink Current	-50mA / +50mA
$I_{CC}$	DC $V_{CC}$ or Ground Current	

**Note:**

- $I_O$  Absolute Maximum Rating must be observed.

## Recommended Operating Conditions<sup>(2)</sup>

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.

**Note:**

- All unused inputs and I/O pins must be held at  $V_{CCI}$  or GND.

**DC Electrical Characteristics** ( $T_A = -40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$ )

Symbol	Parameter	$V_{CCA}$ (V)	$V_{CCB}$ (V)	Conditions	Min.	Typ.	Max.	Units
$V_{IH}$	High Level Input Voltage	1.4–3.6	1.1–3.6	Data inputs $A_n$ , CLK IN, OE	$0.6 \times V_{CCA}$			V
		1.1–1.4	1.1–3.6		$0.9 \times V_{CCA}$			
		1.1–3.6	1.4–3.6	Data inputs $B_n$	$0.6 \times V_{CCB}$			
		1.1–3.6	1.1–1.4		$0.9 \times V_{CCB}$			
$V_{IL}$	Low Level Input Voltage	1.4–3.6	1.1–3.6	Data inputs $A_n$ , CLK IN, OE			$0.35 \times V_{CCA}$	V
		1.1–1.4	1.1–3.6				$0.1 \times V_{CCA}$	
		1.1–3.6	1.4–3.6	Data inputs $B_n$			$0.35 \times V_{CCB}$	
		1.1–3.6	1.1–1.4				$0.1 \times V_{CCB}$	
$V_{OH}^{(3)}$	High Level Output Voltage							

$I_{CCB}^{(7)}$	Quiescent	1.1–3.6	0	$V_I = V_{CCB}$ or GND; $I_O = 0$	-2.0	$\mu A$
	Supply Current	0	1.1–3.6	$V_I = V_{CCA}$ or GND; $I_O = 0$	2.0	

**Notes:**

3. This is the output voltage for static conditions. Dynamic drive specifications are given in “Dynamic Output Electrical Characteristics.”
4. An external driver must source at least the specified current to switch LOW-to-HIGH.
5. An external driver must source at least the specified current to switch HIGH-to-LOW.
6. “Don’t Care” indicates any valid logic level.
7.  $V_{CCI}$  is the  $V_{CC}$  associated with the input side.
8. Reflects current per supply,  $V_{CCA}$  or  $V_{CCB}$ .

**Dynamic Output Electrical Characteristics<sup>(9)</sup>**

**A Port ( $A_n$ )**

Output Load:  $C_L = 15pF$ ,  $R_L = 1M$

		$T_A = -40^{\circ}C$ to $+85^{\circ}C$ , $V_{CCA} =$										
		3.0V to 3.6V		2.3V to 2.7V		1.65V to 1.95V		1.4V to 1.6V		1.1V to 1.3V		
Symbol	Parameter	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Typ.	Max.	Units
$t_{rise}^{(10)}$	Output Rise Time A Port		3.0		3.5		4.0		5.0		7.5	ns
$t_{fall}^{(11)}$	Output Fall Time A Port		3.0		3.5		4.0		5.0		7.5	ns
$I_{OHD}^{(10)}$	Dynamic Output Current High	-18.0		-11.8		-7.4		-5.0		-2.6		mA
$I_{OLD}^{(11)}$	Dynamic Output Current Low	+18.0		+11.8		+7.4		+5.0		+2.6		mA

**B Port ( $B_n$ , CLK OUT)**

Output Load:  $C_L = 15pF$ ,  $R_L = 1M$

$T_A$

Symbol	Parameter
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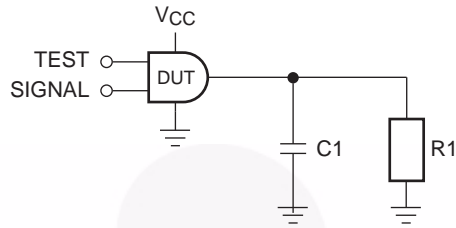
**Notes:**

9. Dynamic Output Characteristics are guaranteed, but not tested.
10. See Figure 5.
11. See Figure 6.







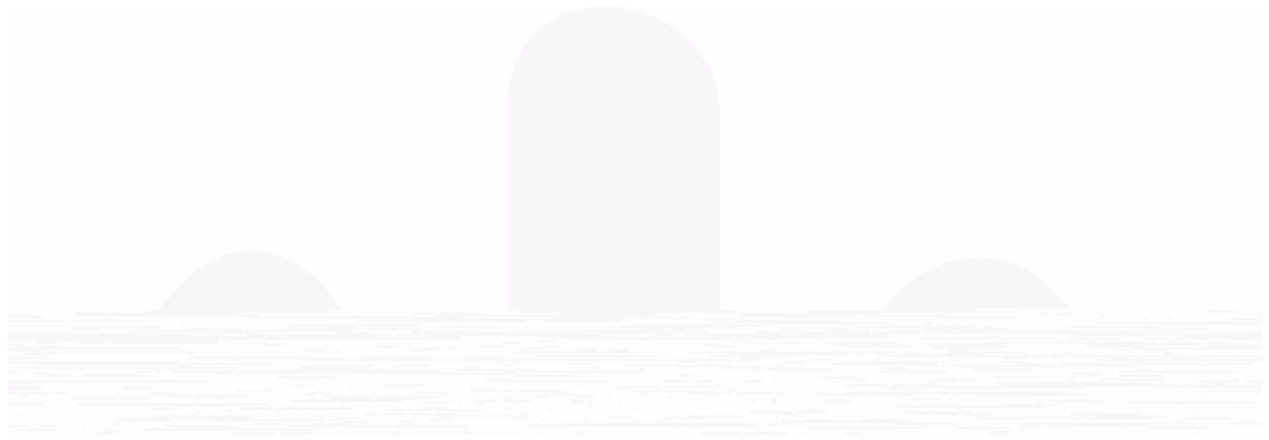


Test	Input Signal	Output Enable Control
$t_{PLH}$ , $t_{PHL}$	Data Pulses	$V_{CCA}$
$t_{PZL}$	0V	Low to High Switch
$t_{PZH}$	$V_{CCI}$	Low to High Switch

Figure 1. AC Test Circuit

**AC Load Table**

$V_{CCO}$	CI	RI
$1.2V \pm 0.1V$	15pF	1M
$1.5V \pm 0.1V$	15pF	1M
$1.8V \pm 0.15V$	15pF	1M
$2.5V \pm 0.2V$	15pF	1M
$3.3 \pm 0.3V$	15pF	1M



## Physical Dimensions



**Figure 9. 16-Terminal Depopulated Quad, Very-Thin Flat Pack, No Leads (DQFN),  
JEDEC MO-241 2.5mm x 3.5mm**

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