# **Dual Differential** 2:1 Multiplexer

The MC100LVEL56 is a dual, fully differential 2:1 multiplexer. The MC100EL56 is pin and functionally equivalent to the MC100LVEL56 but is specified for operation at the standard 100E ECL voltage supply. The differential data path makes the device ideal for multiplexing low skew clock or other skew sensitive signals. Multiple V<sub>BB</sub> pins are provided to ease AC coupling input signals (for more information on AC coupling ECL signals refer to the interfacing section of the ECLinPS data book DL140/D).

The device features both individual and common select inputs to address both data path and random logic applications.

The differential inputs have special circuitry which ensures device stability under open input conditions. When <u>b</u>oth differential inputs are left open the D input will pull down to V<sub>EE</sub>, The D input will bias around V<sub>CC</sub>/2 forcing the Q output LOW.

- Differential Inputs and Outputs
- 20-Lead SOIC Packaging
- 440ps Typical Propagation Delays
- Separate and Common Select
- Supports Both Standard and Low Voltage 100K ECL
- Internal Input Pulldowns
- >2000V ESD Protection



**DW SUFFIX** 

PLASTIC SOIC PACKAGE

CASE 751D-04

MC100LVEL56

### **TRUTH TABLE**

SEL	Data
HL	a b

#### **PIN NAMES**

REV 1

Pins	Function
D0a-D1a	Input Data a
D0b-D1b	Input Data b
SEL0-SEL1	Individual Select Input
COM_SEL	Common Select Input
<u>Q0-Q1</u>	True Outputs
Q0-Q1	Inverted Outputs







# MC100LVEL56 DC CHARACTERISTICS ( $V_{EE} = -3.0V$ to -3.8V; $V_{CC} = GND$ )

		-40°C		0°C			25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Мах	Min	Тур	Max	Unit
IEE	Power Supply Current		20	24		20	24		20	24		20	24	mA
V <sub>BB</sub>	Output Reference Voltage	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	V
Iн	Input HIGH Current			150			150			150			150	μΑ
INL	Input LOW Current Dn Dn	0.5 600			0.5 600			0.5 -600			0.5 600			μA
V <sub>PP</sub> (DC)	Input Sensitivity <sup>1</sup>	50			50			50			50			V

1. Differential input voltage required to obtain a full ECL swing on the outputs.

### MC100LVEL56

AC CHARACTERISTICS (V<sub>EE</sub> = -3.0V to -3.8V; V<sub>CC</sub> = GND)

			-40°C				0°C			25°C			85°C		
Symbol	Characteristic		Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
<sup>t</sup> PLH <sup>t</sup> PHL		(SE) SEL	340 290 430 430		540 590 730 730	350 300 440 440		550 600 740 740	360 310 440 440		560 610 740 740	380 330 450 450		580 630 750 750	ps
<sup>t</sup> SKEW	Within–Device Skew <sup>1</sup>			40	80		40	80		40	80		40	80	ps
<sup>t</sup> SKEW	Duty Cycle Skew <sup>2</sup>				100			100			100			100	ps
V <sub>PP</sub> (AC)	Minimum Input Swing <sup>3</sup>		150		1000	150		1000	150		1000	150		1000	mV
VCMR	Common Mode Range <sup>4</sup> VPP < 500mV VPP ≥ 500mV		-2.0 -1.8		-0.4 -0.4	-2.1 -1.9		-0.4 -0.4	-2.1 -1.9		-0.4 -0.4	-2.1 -1.9		-0.4 -0.4	V
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Times Q (20% – 80%)		200		540	200		540	200		540	200		540	ps

1. Within-device skew is defined as identical transitions on similar paths through a device.

2. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.

3. Minimum input swing for which AC parameters are guaranteed.

4. The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between Vppmin and 1V. The lower end of the CMR range varies 1:1 with V<sub>EE</sub>. The numbers in the spec table assume a nominal V<sub>EE</sub> = -3.3V. Note for PECL operation, the V<sub>CMR</sub>(min) will be fixed at 3.3V – |V<sub>CMR</sub>(min)|.

# MC100EL56 DC CHARACTERISTICS (V<sub>EE</sub> = -4.2V to -5.5V; V<sub>CC</sub> = GND)

		–40°C		0°C			25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Мах	Min	Тур	Max	Unit
IEE	Power Supply Current		20	24		20	24		20	24		20	24	mA
V <sub>BB</sub>	Output Reference Voltage	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	V
Ιн	Input HIGH Current			150			150			150			150	μA
INL	Input LOW Current Dn Dn	0.5 600			0.5 600			0.5 600			0.5 600			μA
V <sub>PP</sub> (DC)	Input Sensitivity <sup>1</sup>	50			50			50			50			V

1. Differential input voltage required to obtain a full ECL swing on the outputs.

## MC100EL56

### AC CHARACTERISTICS (V<sub>EE</sub> = -4.2V to -5.5V; V<sub>CC</sub> = GND)

			-40°C			0°C			25°C			85°C			
Symbol	Characteristic		Min	Тур	Max	Unit									
<sup>t</sup> PLH <sup>t</sup> PHL	Propagation Delay to Output	D (Diff) D (SE) SEL COMSEL	340 290 430 430		540 590 730 730	350 300 440 440		550 600 740 740	360 310 440 440		560 610 740 740	380 330 450 450		580 630 750 750	ps
<sup>t</sup> SKEW	Within–Device Skew <sup>1</sup>			40	80		40	80		40	80		40	80	ps
<sup>t</sup> SKEW	Duty Cycle Skew <sup>2</sup>				100			100			100			100	ps
V <sub>PP</sub> (AC)	Minimum Input Swing <sup>3</sup>		150		1000	150		1000	150		1000	150		1000	mV
VCMR	Common Mode Range <sup>4</sup> VPP < 500mV VPP ≥ 500mV		-3.2 -3.0		-0.4 -0.4	-3.3 -3.1		-0.4 -0.4	-3.3 -3.1		-0.4 -0.4	-3.3 -3.1		-0.4 -0.4	V
t <sub>r</sub> t <sub>f</sub>	Output Rise/Fall Times Q (20% – 80%)		200		540	200		540	200		540	200		540	ps

1. Within-device skew is defined as identical transitions on similar paths through a device.

2. Duty cycle skew is defined only for differential operation when the delays are measured from the cross point of the inputs to the cross point of the outputs.

3. Minimum input swing for which AC parameters are guaranteed.

4. The CMR range is referenced to the most positive side of the differential input signal. Normal operation is obtained if the HIGH level falls within the specified range and the peak-to-peak voltage lies between V<sub>PP</sub>min and 1V. The lower end of the CMR range varies 1:1 with V<sub>EE</sub>. The numbers in the spec table assume a nominal V<sub>EE</sub> = -4.5V. Note for PECL operation, the V<sub>CMR</sub>(min) will be fixed at 5.0V – |V<sub>CMR</sub>(min)|.

### **OUTLINE DIMENSIONS**



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