4:1 Differential Multiplexer

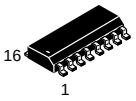
MC10EL57
MC100EL57

The MC10/100EL57 is a fully differential 4:1 multiplexer. By leaving the SEL1 line open (pulled LOW via the input pulldown resistors) the device can also be used as a differential 2:1 multiplexer with SEL0 input selecting between D0 and D1. The fully differential architecture of the EL57 makes it ideal for use in low skew applications such as clock distribution.

The SEL1 is the most significant select line. The binary number applied to the select inputs will select the same numbered data input (i.e., 00 selects D0).

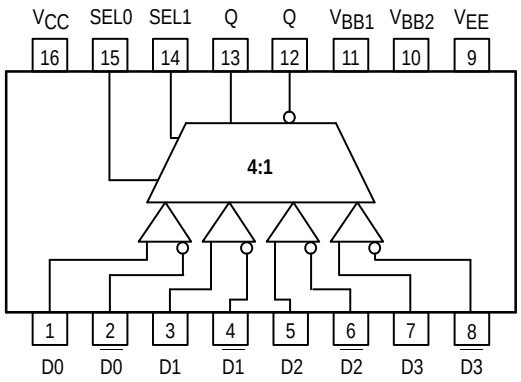
Multiple V_{BB} outputs are provided for single-ended or AC coupled interfaces. In these scenarios, the V_{BB} output should be connected to the data bar inputs and bypassed via a 0.01µF capacitor to ground. Note that the V_{BB} output can source/sink up to 0.5mA of current without upsetting the voltage level.

- Useful as Either 4:1 or 2:1 Multiplexer
- V_{BB} Output for Single-Ended Operation
- 75kΩ Internal Input Pulldown Resistors
- >1000V ESD Protection



D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751B-05

LOGIC DIAGRAM AND PINOUT ASSIGNMENT



PIN DESCRIPTION

PIN	FUNCTION
D0–3	Diff Data Inputs
SEL0,1	Mux Select Inputs
V_{BB}	Reference Output
Q0	Data Outputs

FUNCTION TABLE

SEL1	SEL0	DATA OUT
L	L	D0
L	H	D1
H	L	D2
H	H	D3

ABSOLUTE MAXIMUM RATINGS[1]

Symbol	Characteristic	Rating	Unit
V_{EE}	Power Supply (V_{CC} = 0V)	–8.0 to 0	VDC
V_I	Input Voltage (V_{CC} = 0V)	0 to –6.0	VDC
I_{out}	Output Current Continuous Surge	50 100	mA
T_A	Operating Temperature Range	–40 to +85	°C
V_{EE}	Operating Range[1,2]	–5.7 to –4.2	V

1. Absolute maximum rating, beyond which, device life may be impaired, unless otherwise specified on an individual data sheet.
2. Parametric values specified at: 10EL Series: –4.94V to –5.50V
   100EL Series: –4.20V to –5.50V

10EL SERIES
DC CHARACTERISTICS (V_{EE} = V_{EE}(min) – V_{EE}(max); V_{CC} = GND[1])

Symbol	Characteristic	–40°C		0°C		25°C		85°C		Unit
		Min	Max	Min	Max	Min	Max	Min	Max	
V_{OH}	Output HIGH Voltage	–1080	–890	–1020	–840	–980	–810	–910	–720	mV
V_{OL}	Output LOW Voltage	–1950	–1650	–1950	–1630	–1950	–1630	–1950	–1595	mV
V_{IH}	Input HIGH Voltage	–1230	–890	–1170	–840	–1130	–810	–1060	–720	mV
V_{IL}	Input LOW Voltge	–1950	–1500	–1950	–1480	–1950	–1480	–1950	–1445	mV
I_{IL}	Input LOW Current	0.5	—	0.5	—	0.5	—	0.3	—	µA

1. 10EL circuits are designed to meet the DC specifications shown in the table after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse airflow greater than 500lfpm is maintained. Outputs are terminated through a 50Ω resistor to –2.0V except where otherwise specified on the individual data sheets.

100EL SERIES
DC CHARACTERISTICS (V_{EE} = V_{EE}(min) – V_{EE}(max); V_{CC} = GND[1])

Symbol	Characteristic	–40°C			0°C to 85°C			Unit	Condition
		Min	Typ	Max	Min	Typ	Max		
V_{OH}	Output HIGH Voltage	–1085	–1005	–880	–1025	–955	–880	mV	V_{IN} = V_{IH}(max)
V_{OL}	Output LOW Voltage	–1830	–1695	–1555	–1810	–1705	–1620	mV	or V_{IL}(min)
V_{OHA}	Output HIGH Voltage	–1095	—	—	–1035	—	—	mV	V_{IN} = V_{IH}(max)
V_{OLA}	Output LOW Voltage	—	—	–1555	—	—	–1610	mV	or V_{IL}(min)
V_{IH}	Input HIGH Voltage	–1165	—	–880	–1165	—	–880	mV	
V_{IL}	Input LOW Voltge	–1810	—	–1475	–1810	—	–1475	mV	
I_{IL}	Input LOW Current	0.5	—	—	0.5	—	—	µA	V_{IN} = V_{IL}(max)

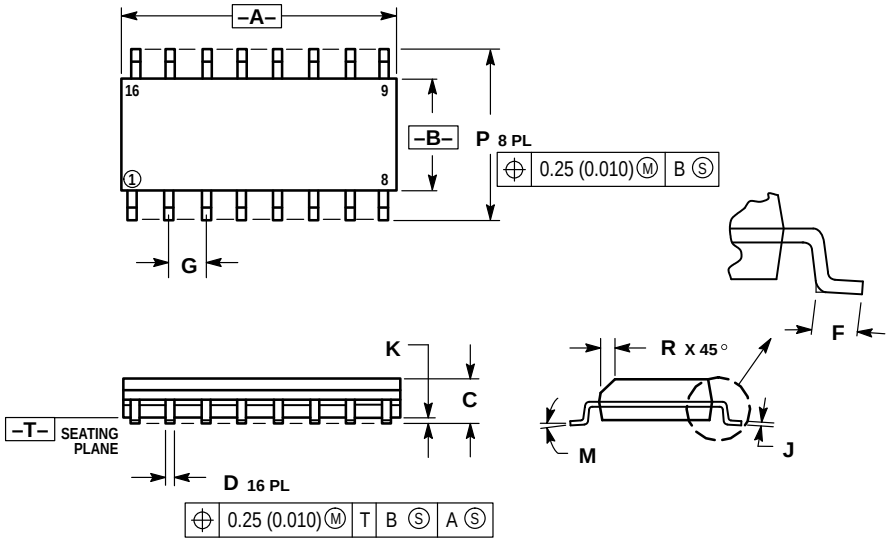
1. This table replaces the three tables traditionally seen in ECL 100K data books. The same DC parameter values at V_{EE} = –4.5V now apply across the full V_{EE} range of –4.2V to –5.5V. Outputs are terminated through a 50Ω resistor to –2.0V except where otherwise specified on the individual data sheets.

AC/DC CHARACTERISTICS (V_{EE} = V_{EE}(min) to V_{EE}(max); V_{CC} = GND)

Symbol	Characteristic	–40°C			0°C			25°C			85°C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current 10EL 100EL			24 24			24 24			24 24			24 27	mA
V_{BB}	Output Reference Voltage 10EL 100EL	–1.43 –1.38		–1.30 –1.26	–1.38 –1.38		–1.27 –1.26	–1.35 –1.38		–1.25 –1.26	–1.31 –1.38		–1.19 –1.26	V
I_{IH}	Input High Current			150			150			150			150	µA
t_{PLH} t_{PHL}	Propagation Delay DATA→Q/$\overline{Q}$ SEL→Q/$\overline{Q}$	350 440		550 690	350 440		550 690	360 440		560 690	380 460		580 710	ps
t_{SKEW}	Input Skew D_n, D_m to Q			100			100			100			100	ps
V_{PP}	Minimum Input Swing CLK	250			250			250			250			mV
V_{CMR}	Common Mode Range CLK	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	–2.0		–0.4	V
t_r t_f	Output Rise/Fall Times Q (20% – 80%)	125		375	125		375	125		375	125		375	ps

OUTLINE DIMENSIONS

D SUFFIX
PLASTIC SOIC PACKAGE
CASE 751B-05
ISSUE J



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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