

## 4:1 Differential Multiplexer

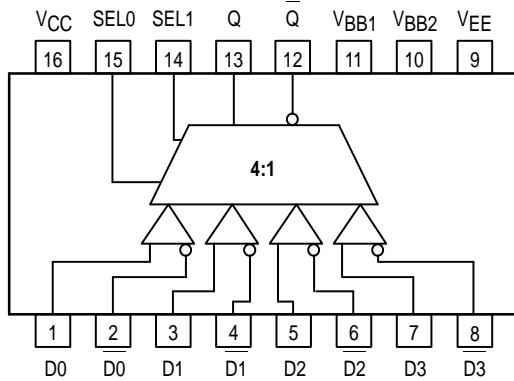
The MC10/100EL57 is a fully differential 4:1 multiplexer. By leaving the SEL1 line open (pulled LOW via the input pulldown resistors) the device can also be used as a differential 2:1 multiplexer with SEL0 input selecting between D0 and D1. The fully differential architecture of the EL57 makes it ideal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

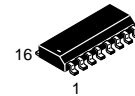
Multiple  $V_{BB}$  outputs are provided for single-ended or AC coupled interfaces. In these scenarios, the  $V_{BB}$  output should be connected to the data bar inputs and bypassed via a  $0.01\mu\text{F}$  capacitor to ground. Note that the  $V_{BB}$  output can source/sink up to 0.5mA of current without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

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

### LOGIC DIAGRAM AND PINOUT ASSIGNMENT



## MC10EL57 MC100EL57



**D SUFFIX**  
PLASTIC SOIC PACKAGE  
CASE 751B-05

### PIN DESCRIPTION

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

### FUNCTION TABLE

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

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

Symbol	Characteristic	Rating	Unit
$V_{EE}$	Power Supply ( $V_{CC} = 0\text{V}$ )	-8.0 to 0	VDC
$V_I$	Input Voltage ( $V_{CC} = 0\text{V}$ )	0 to -6.0	VDC
$I_{out}$	Output Current Continuous Surge	50 100	mA
$T_A$	Operating Temperature Range	-40 to +85	$^{\circ}\text{C}$
$V_{EE}$	Operating Range <sup>1,2</sup>	-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



# MC10EL57 MC100EL57

## 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 <sub>OH</sub>	Output HIGH Voltage	-1080	-890	-1020	-840	-980	-810	-910	-720	mV
V <sub>OL</sub>	Output LOW Voltage	-1950	-1650	-1950	-1630	-1950	-1630	-1950	-1595	mV
V <sub>IH</sub>	Input HIGH Voltage	-1230	-890	-1170	-840	-1130	-810	-1060	-720	mV
V <sub>IL</sub>	Input LOW Voltage	-1950	-1500	-1950	-1480	-1950	-1480	-1950	-1445	mV
I <sub>IL</sub>	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 500lpm 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 <sub>OH</sub>	Output HIGH Voltage	-1085	-1005	-880	-1025	-955	-880	mV	V <sub>IN</sub> = V <sub>IH</sub> (max) or V <sub>IL</sub> (min)
V <sub>OL</sub>	Output LOW Voltage	-1830	-1695	-1555	-1810	-1705	-1620	mV	
V <sub>OHA</sub>	Output HIGH Voltage	-1095	—	—	-1035	—	—	mV	V <sub>IN</sub> = V <sub>IH</sub> (max) or V <sub>IL</sub> (min)
V <sub>OLA</sub>	Output LOW Voltage	—	—	-1555	—	—	-1610	mV	
V <sub>IH</sub>	Input HIGH Voltage	-1165	—	-880	-1165	—	-880	mV	
V <sub>IL</sub>	Input LOW Voltage	-1810	—	-1475	-1810	—	-1475	mV	
I <sub>IL</sub>	Input LOW Current	0.5	—	—	0.5	—	—	μA	V <sub>IN</sub> = V <sub>IL</sub> (max)

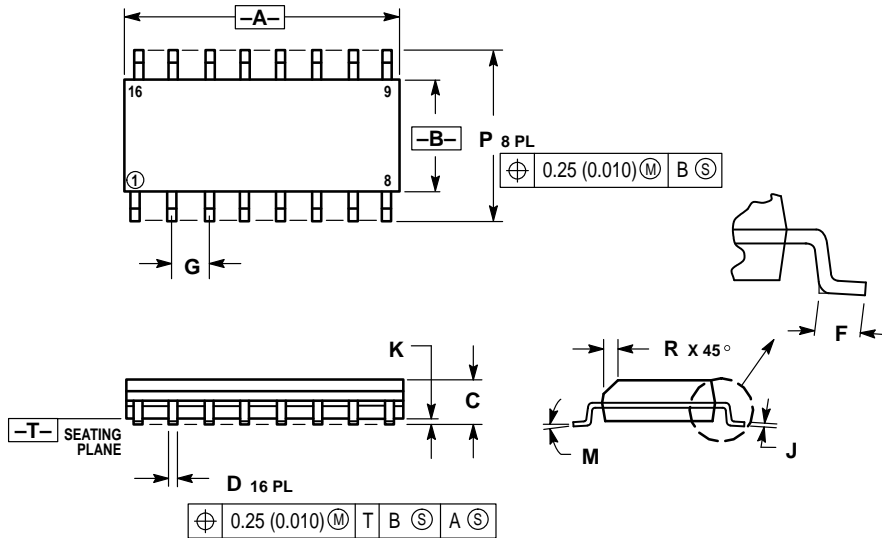
1. This table replaces the three tables traditionally seen in ECL 100K data books. The same DC parameter values at V<sub>EE</sub> = -4.5V now apply across the full V<sub>EE</sub> range of -4.2V to -5.5V. Outputs are terminated through a 50Ω resistor to -2.0V except where otherwise specified on the individual 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 <sub>EE</sub>	Power Supply Current			24			24			24			24	mA
				24			24			24			27	
V <sub>BB</sub>	Output Reference Voltage	-1.43		-1.30	-1.38		-1.27	-1.35		-1.25	-1.31		-1.19	V
		-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	-1.38		-1.26	
I <sub>IH</sub>	Input High Current			150			150			150			150	μA
t <sub>PLH</sub>	Propagation Delay DATA→Q/Q	350		550	350		550	360		560	380		580	ps
t <sub>PHL</sub>	Delay SEL→Q/Q	440		690	440		690	440		690	460		710	
t <sub>SKEW</sub>	Input Skew D <sub>n</sub> , D <sub>m</sub> to Q			100			100			100			100	ps
V <sub>PP</sub>	Minimum Input Swing CLK	250			250			250			250			mV
V <sub>CMR</sub>	Common Mode Range CLK	-2.0		-0.4	-2.0		-0.4	-2.0		-0.4	-2.0		-0.4	V
t <sub>r</sub>	Output Rise Times Q	125		375	125		375	125		375	125		375	ps
t <sub>f</sub>	Fall Times Q													

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.

DIM	MILLIMETERS		INCHES	
	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

Motorola reserves the right to make changes without further notice to any products herein. Motorola makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does Motorola assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation consequential or incidental damages. "Typical" parameters which may be provided in Motorola data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. Motorola does not convey any license under its patent rights nor the rights of others. Motorola products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the Motorola product could create a situation where personal injury or death may occur. Should Buyer purchase or use Motorola products for any such unintended or unauthorized application, Buyer shall indemnify and hold Motorola and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that Motorola was negligent regarding the design or manufacture of the part. Motorola and are registered trademarks of Motorola, Inc. Motorola, Inc. is an Equal Opportunity/Affirmative Action Employer.

How to reach us:

USA/EUROPE/Locations Not Listed: Motorola Literature Distribution; P.O. Box 20912; Phoenix, Arizona 85036. 1-800-441-2447 or 602-303-5454

JAPAN: Nippon Motorola Ltd.; Tatsumi-SPD-JLDC, 6F Seibu-Butsuryu-Center, 3-14-2 Tatsumi Koto-Ku, Tokyo 135, Japan. 03-81-3521-8315

MFAX: RMFAX0@email.sps.mot.com – TOUCHTONE 602-244-6609  
INTERNET: <http://Design-NET.com>

ASIA/PACIFIC: Motorola Semiconductors H.K. Ltd.; 8B Tai Ping Industrial Park, 51 Ting Kok Road, Tai Po, N.T., Hong Kong. 852-26629298

