

MC10EL58, MC100EL58

5V ECL 2:1 Multiplexer

The MC10EL/100EL58 is a 2:1 multiplexer. The device is functionally equivalent to the E158 device with higher performance capabilities. With propagation delays and output transition times significantly faster than the E158, the EL58 is ideally suited for those applications which require the ultimate in AC performance.

The 100 Series contains temperature compensation.

- 230 ps Propagation Delay
- PECL Mode Operating Range: $V_{CC} = 4.2\text{ V}$ to 5.7 V with $V_{EE} = 0\text{ V}$
- NECL Mode Operating Range: $V_{CC} = 0\text{ V}$ with $V_{EE} = -4.2\text{ V}$ to -5.7 V
- Internal Input Pulldown Resistors on D_a , D_b , and SEL

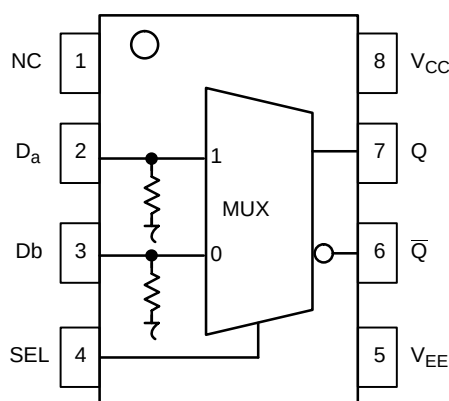


Figure 1. Logic Diagram and Pin Assignment

PIN DESCRIPTION

PIN	FUNCTION
D_a , D_b	ECL Data Inputs
Q , $\bar{Q}$	ECL Data Outputs
SEL	ECL Select Input
V_{CC}	Positive Supply
V_{EE}	Negative Supply
NC	No Connect

FUNCTION TABLE

SEL*	Data
H	a
L	b

* Pin will default low when left open.



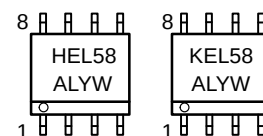
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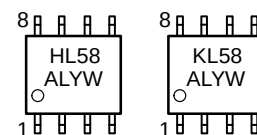
MARKING DIAGRAMS*



SO-8
D SUFFIX
CASE 751



TSSOP-8
DT SUFFIX
CASE 948R



H = MC10
K = MC100
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week

*For additional marking information, refer to Application Note AND8002/D.

ORDERING INFORMATION

Device	Package	Shipping**
MC10EL58D	SO-8	98 Units/Rail
MC10EL58DR2	SO-8	2500 Tape & Reel
MC100EL58D	SO-8	98 Units/Rail
MC100EL58DR2	SO-8	2500 Tape & Reel
MC10EL58DT	TSSOP-8	98 Units/Rail
MC10EL58DTR2	TSSOP-8	2500 Tape & Reel
MC100EL58DT	TSSOP-8	98 Units/Rail
MC100EL58DTR2	TSSOP-8	2500 Tape & Reel

**For additional tape and reel information, refer to Brochure BR1011/D.

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ATTRIBUTES

Characteristics	Value
Internal Input Pulldown Resistor	75 k Ω
Internal Input Pullup Resistor	N/A
ESD Protection Human Body Model Machine Model	> 1 kV > 100 V
Moisture Sensitivity, Indefinite Time Out of Drypack (Note 1)	Level 1
Flammability Rating Oxygen Index: 28 to 34	UL 94 V-0 @ 0.125 in
Transistor Count	45
Meets or exceeds JEDEC Spec EIA/JESD78 IC Latchup Test	

1. Refer to Application Note AND8003/D for additional information.

MAXIMUM RATINGS (Note 2)

Symbol	Parameter	Condition 1	Condition 2	Rating	Units
V _{CC}	PECL Mode Power Supply	V _{EE} = 0 V		8	V
V _{EE}	NECL Mode Power Supply	V _{CC} = 0 V		-8	V
V _I	PECL Mode Input Voltage NECL Mode Input Voltage	V _{EE} = 0 V V _{CC} = 0 V	V _I ≤ V _{CC} V _I ≥ V _{EE}	6 -6	V V
I _{out}	Output Current	Continuous Surge		50 100	mA mA
T _A	Operating Temperature Range			-40 to +85	°C
T _{stg}	Storage Temperature Range			-65 to +150	°C
θ _{JA}	Thermal Resistance (Junction-to-Ambient)	0 LFPM 500 LFPM	SO-8 SO-8	190 130	°C/W °C/W
θ _{JC}	Thermal Resistance (Junction-to-Case)		SO-8	41 to 44	°C/W
θ _{JA}	Thermal Resistance (Junction-to-Ambient)	0 LFPM 500 LFPM	TSSOP-8 TSSOP-8	185 140	°C/W °C/W
θ _{JC}	Thermal Resistance (Junction-to-Case)	Standard Board	TSSOP-8	41 to 44	°C/W
T _{sol}	Wave Solder	<2 to 3 sec @ 248°C		265	°C

2. Maximum Ratings are those values beyond which device damage may occur.

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10EL SERIES PECL DC CHARACTERISTICS $V_{CC}=5.0\text{ V}$; $V_{EE}=0.0\text{ V}$ (Note 3)

Symbol	Characteristic	-40 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current		14	17		14	17		14	17	mA
V_{OH}	Output HIGH Voltage (Note 4)	3920	4010	4110	4020	4105	4190	4090	4185	4280	mV
V_{OL}	Output LOW Voltage (Note 4)	3050	3200	3350	3050	3210	3370	3050	3227	3405	mV
V_{IH}	Input HIGH Voltage	3770		4110	3870		4190	3940		4280	mV
V_{IL}	Input LOW Voltage	3050		3500	3050		3520	3050		3555	mV
I_{IH}	Input HIGH Current			150			150			150	μA
I_{IL}	Input LOW Current	0.5			0.5			0.3			μA

NOTE: Devices are designed to meet the DC specifications shown in the above table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 lpm is maintained.

3. Input and output parameters vary 1:1 with V_{CC} . V_{EE} can vary +0.06 V / -0.5 V.

4. Outputs are terminated through a 50 ohm resistor to V_{CC} -2 volts.

10EL SERIES NECL DC CHARACTERISTICS $V_{CC}=0.0\text{ V}$; $V_{EE}=-5.0\text{ V}$ (Note 5)

Symbol	Characteristic	-40 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current		14	17		14	17		14	17	mA
V_{OH}	Output HIGH Voltage (Note 6)	-1080	-990	-890	-980	-895	-810	-910	-815	-720	mV
V_{OL}	Output LOW Voltage (Note 6)	-1950	-1800	-1650	-1950	-1790	-1630	-1950	-1773	-1595	mV
V_{IH}	Input HIGH Voltage	-1230		-890	-1130		-810	-1060		-720	mV
V_{IL}	Input LOW Voltage	-1950		-1500	-1950		-1480	-1950		-1445	mV
I_{IH}	Input HIGH Current			150			150			150	μA
I_{IL}	Input LOW Current	0.5			0.5			0.3			μA

NOTE: Devices are designed to meet the DC specifications shown in the above table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 lpm is maintained.

5. Input and output parameters vary 1:1 with V_{CC} . V_{EE} can vary +0.06 V / -0.5 V.

6. Outputs are terminated through a 50 ohm resistor to V_{CC} -2 volts.

100EL SERIES PECL DC CHARACTERISTICS $V_{CC}=5.0\text{ V}$; $V_{EE}=0.0\text{ V}$ (Note 7)

Symbol	Characteristic	-40 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current		14	17		14	17		16	19	mA
V_{OH}	Output HIGH Voltage (Note 8)	3915	3995	4120	3975	4045	4120	3975	4050	4120	mV
V_{OL}	Output LOW Voltage (Note 8)	3170	3305	3445	3190	3295	3380	3190	3295	3380	mV
V_{IH}	Input HIGH Voltage	3835		4120	3835		4120	3835		4120	mV
V_{IL}	Input LOW Voltage	3190		3525	3190		3525	3190		3525	mV
I_{IH}	Input HIGH Current			150			150			150	μA
I_{IL}	Input LOW Current	0.5			0.5			0.5			μA

NOTE: Devices are designed to meet the DC specifications shown in the above table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 lpm is maintained.

7. Input and output parameters vary 1:1 with V_{CC} . V_{EE} can vary +0.8 V / -0.5 V.

8. Outputs are terminated through a 50 ohm resistor to V_{CC} -2 volts.

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100EL SERIES NECL DC CHARACTERISTICS $V_{CC}=0.0\text{ V}$; $V_{EE}=-5.0\text{ V}$ (Note 9)

Symbol	Characteristic	-40 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
I_{EE}	Power Supply Current		14	17		14	17		16	19	mA
V_{OH}	Output HIGH Voltage (Note 10)	- 1085	- 1005	- 880	- 1025	- 955	- 880	- 1025	- 955	- 880	mV
V_{OL}	Output LOW Voltage (Note 10)	- 1830	- 1695	- 1555	- 1810	- 1705	- 1620	- 1810	- 1705	- 1620	mV
V_{IH}	Input HIGH Voltage	- 1165		- 880	- 1165		- 880	- 1165		- 880	mV
V_{IL}	Input LOW Voltage	- 1810		- 1475	- 1810		- 1475	- 1810		- 1475	mV
I_{IH}	Input HIGH Current			150			150			150	μA
I_{IL}	Input LOW Current	0.5			0.5			0.5			μA

NOTE: Devices are designed to meet the DC specifications shown in the above table, after thermal equilibrium has been established. The circuit is in a test socket or mounted on a printed circuit board and transverse air flow greater than 500 lfpm is maintained.

9. Input and output parameters vary 1:1 with V_{CC} . V_{EE} can vary +0.8 V / -0.5 V.

10. Outputs are terminated through a 50 ohm resistor to $V_{CC}-2$ volts.

AC CHARACTERISTICS $V_{CC}=5.0\text{ V}$; $V_{EE}=0.0\text{ V}$ or $V_{CC}=0.0\text{ V}$; $V_{EE}=-5.0\text{ V}$ (Note 11)

Symbol	Characteristic	-40 °C			25 °C			85 °C			Unit
		Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
$f_{\max}$	Maximum Toggle Frequency					1.5					GHz
t_{PLH} t_{PHL}	Propagation Delay to Output D to Q SEL to Q	60 90	220 250	380 410	120 150	230 260	340 370	140 170	250 280	360 390	ps
t_{JITTER}	Random Clock Jitter (RMS)					0.9					ps
t_r t_f	Output Rise/Fall Times Q (20% - 80%)	100	225	350	100	225	350	100	225	350	ps

11. 10 Series: V_{EE} can vary +0.06 V / -0.5 V.

100 Series: V_{EE} can vary +0.8 V / -0.5 V.

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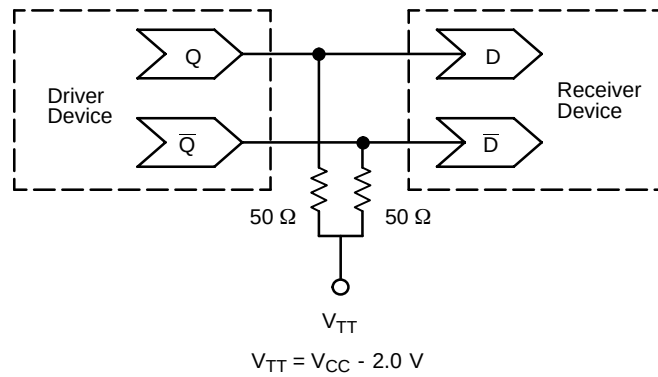


Figure 2. Typical Termination for Output Driver and Device Evaluation
(See Application Note AND8020 - Termination of ECL Logic Devices.)

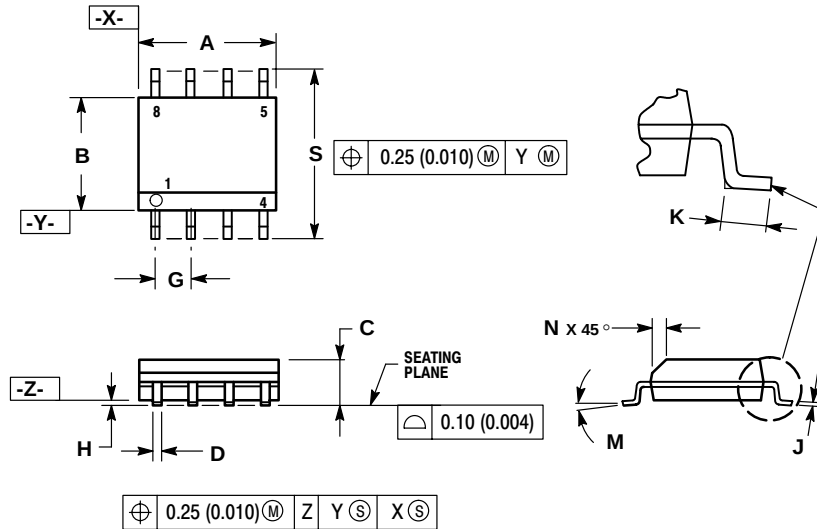
Resource Reference of Application Notes

AN1404	- ECLinPS Circuit Performance at Non-Standard V_{IH} Levels
AN1405	- ECL Clock Distribution Techniques
AN1406	- Designing with PECL (ECL at +5.0 V)
AN1503	- ECLinPS I/O SPICE Modeling Kit
AN1504	- Metastability and the ECLinPS Family
AN1560	- Low Voltage ECLinPS SPICE Modeling Kit
AN1568	- Interfacing Between LVDS and ECL
AN1596	- ECLinPS Lite Translator ELT Family SPICE I/O Model Kit
AN1650	- Using Wire-OR Ties in ECLinPS Designs
AN1672	- The ECL Translator Guide
AND8001	- Odd Number Counters Design
AND8002	- Marking and Date Codes
AND8020	- Termination of ECL Logic Devices
AND8090	- AC Characteristics of ECL Devices

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PACKAGE DIMENSIONS

SO-8 D SUFFIX PLASTIC SOIC PACKAGE CASE 751-07 ISSUE AA



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION 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.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

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