5 V ECL 4-Input OR/NOR

MC10EL01, MC100EL01

Description

The MC10EL/100EL01 is a 4-input OR/NOR gate. The device is functionally equivalent to the E101 device with higher performance capabilities. With propagation delays and output transition times significantly faster than the E101, the EL01 is ideally suited for those applications which require the ultimate in AC performance.

The 100 series contains temperature compensation.

Features

- 230 ps Propagation Delay
- ESD Protection:
 - ♦ > 1 kV Human Body Model
 - ♦ > 100 V Machine Model
- 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
- Meets or Exceeds JEDEC Spec EIA/JESD78 IC Latchup Test
- Moisture Sensitivity Level
 - ◆ Level 1 for SOIC-8
 - For Additional Information, see Application Note <u>AND8003/D</u>
- Flammability Rating:
 - ◆ UL 94 V-0 @ 0.125 in, Oxygen Index: 28 to 34
- Transistor Count = 46 devices
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

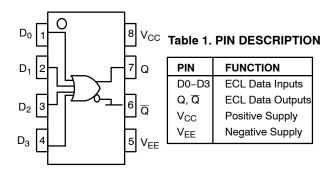


Figure 1. Logic Diagram and Pinout Assignment



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SOIC-8 D SUFFIX CASE 751-07

MARKING DIAGRAM*





H = MC10

K = MC100

A = Assembly Location

L = Wafer Lot

Y = Year

W = Work Week

= Pb-Free Package

(Note: Microdot may be in either location)

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

ORDERING INFORMATION

Device	Package	Shipping [†]
MC10EL01DG	SOIC-8 (Pb-Free)	98 Units / Tube
MC100EL01DG	SOIC-8 (Pb-Free)	98 Units / Tube
MC100EL01DR2G	SOIC-8 (Pb-Free)	2500 / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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MC10EL01, MC100EL01

Table 2. MAXIMUM RATINGS

Symbol	Parameter	Condition 1	Condition 2	Rating	Unit
V _{CC}	PECL Mode Power Supply	V _{EE} = 0 V		8	V
V _{EE}	NECL Mode Power Supply	V _{CC} = 0 V		-8	V
VI	PECL Mode Input Voltage NECL Mode Input Voltage	V _{EE} = 0 V V _{CC} = 0 V	$\begin{array}{l} V_I \leq V_{CC} \\ V_I \geq V_{EE} \end{array}$	6 -6	V
l _{out}	Output Current	Continuous Surge		50 100	mA
T _A	Operating Temperature Range			-40 to +85	°C
T _{stg}	Storage Temperature Range			−65 to +150	°C
θJA	Thermal Resistance (Junction-to-Ambient)	0 lfpm 500 lfpm	SOIC-8	190 130	°C/W
$\theta_{\sf JC}$	Thermal Resistance (Junction-to-Case)	Standard Board	SOIC-8	41 to 44	°C/W
T _{sol}	Wave Solder (Pb-Free)	<2 to 3 sec @ 260°C		265	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Table 3. 10EL SERIES PECL DC CHARACTERISTICS ($V_{CC} = 5.0 \text{ V}$; $V_{EE} = 0.0 \text{ V}$ (Note 1))

		-40°C		25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
I _{EE}	Power Supply Current		14	17		14	17		14	17	mA
V _{OH}	Output HIGH Voltage (Note 2)	3920	4010	4110	4020	4105	4190	4090	4185	4280	mV
V _{OL}	Output LOW Voltage (Note 2)	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	μΑ
I _{IL}	Input LOW Current	0.5			0.5			0.3			μΑ

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

Table 4. 10EL SERIES NECL DC CHARACTERISTICS ($V_{CC} = 0.0 \text{ V}$; $V_{EE} = -5.0 \text{ V}$ (Note 1))

		-40°C		25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
I _{EE}	Power Supply Current		14	17		14	17		14	17	mA
V _{OH}	Output HIGH Voltage (Note 2)	-1080	-990	-890	-980	-895	-810	-910	-815	-720	mV
V _{OL}	Output LOW Voltage (Note 2)	-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	μΑ
I _{IL}	Input LOW Current	0.5			0.5			0.3			μΑ

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

- 1. Input and output parameters vary 1:1 with V $_{CC}$. V $_{EE}$ can vary +0.25 V / -0.5 V. 2. Outputs are terminated through a 50 Ω resistor to V $_{CC}$ 2.0 V.

^{1.} Input and output parameters vary 1:1 with V $_{CC}$. V $_{EE}$ can vary +0.25 V / -0.5 V. 2. Outputs are terminated through a 50 Ω resistor to V $_{CC}$ - 2.0 V.

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Table 5. 100EL SERIES PECL DC CHARACTERISTICS (V_{CC} = 5.0 V; V_{EE} = 0.0 V (Note 1))

		-40°C		25°C		85°C					
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
I _{EE}	Power Supply Current		14	17		14	17		16	20	mA
V _{OH}	Output HIGH Voltage (Note 2)	3915	3995	4120	3975	4045	4120	3975	4050	4120	mV
V _{OL}	Output LOW Voltage (Note 2)	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	μΑ
I _{IL}	Input LOW Current	0.5			0.5			0.5			μΑ

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

- 1. Input and output parameters vary 1:1 with V $_{CC}$. V $_{EE}$ can vary +0.8 V / -0.5 V. 2. Outputs are terminated through a 50 Ω resistor to V $_{CC}$ 2.0 V.

Table 6. 100EL SERIES NECL DC CHARACTERISTICS (V_{CC} = 0.0 V; V_{EE} = -5.0 V (Note 1))

		-40°C		25°C		85°C					
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
I _{EE}	Power Supply Current		14	17		14	17		16	20	mA
V _{OH}	Output HIGH Voltage (Note 2)	-1085	-1005	-880	-1025	-955	-880	-1025	-955	-880	mV
V _{OL}	Output LOW Voltage (Note 2)	-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	μΑ
I _{IL}	Input LOW Current	0.5			0.5			0.5			μΑ

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

- 1. Input and output parameters vary 1:1 with V_{CC}. V_{EE} can vary +0.8 V / -0.5 V. 2. Outputs are terminated through a 50 Ω resistor to V_{CC} 2.0 V.

Table 7. 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 1))

		-40°C		25°C			85°C				
Symbol	Characteristic	Min	Тур	Max	Min	Тур	Max	Min	Тур	Max	Unit
f _{MAX}	Maximum Toggle Frequency		TBD			TBD			TBD		GHz
t _{PLH} t _{PHL}	Propagation Delay to Output	70	220	370	130	230	330	150	250	350	ps
[‡] JITTER	Cycle-to-Cycle Jitter		TBD			TBD			TBD		ps
t _r t _f	Output Rise/Fall Times Q (20% - 80%)	100	225	350	100	225	350	100	225	350	ps

NOTE: Device will meet the specifications after thermal equilibrium has been established when mounted in a test socket or printed circuit board with maintained transverse airflow greater than 500 lfpm.

1. 10 Series: V_{EE} can vary +0.25 V / -0.5 V. 100 Series: V_{EE} can vary +0.8 V / -0.5 V.

MC10EL01, MC100EL01

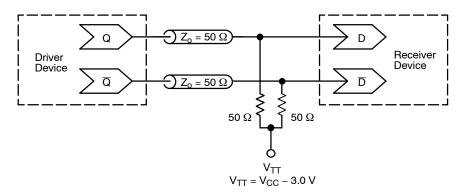


Figure 2. Typical Termination for Output Driver and Device Evaluation (See Application Note <u>AND8020/D</u> – Termination of ECL Logic Devices.)

Resource Reference of Application Notes

AN1405/D - ECL Clock Distribution Techniques

AN1406/D - Designing with PECL (ECL at +5.0 V)

AN1503/D - ECLinPS™ I/O SPiCE Modeling Kit

AN1504/D - Metastability and the ECLinPS Family

AN1568/D - Interfacing Between LVDS and ECL

AN1672/D - The ECL Translator Guide

AND8001/D - Odd Number Counters Design

AND8002/D - Marking and Date Codes

AND8020/D - Termination of ECL Logic Devices

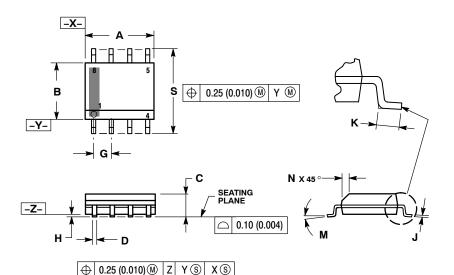
AND8066/D – Interfacing with ECLinPS

AND8090/D - AC Characteristics of ECL Devices



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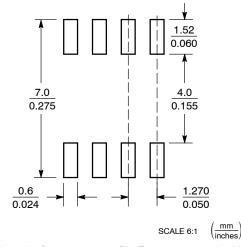
DATE 16 FEB 2011



- NOTES:
 1. DIMENSIONING AND TOLERANCING PER
- ANSI Y14.5M, 1982.
 CONTROLLING DIMENSION: MILLIMETER.
- DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
- MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE
- 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.
- 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

	MILLIN	IETERS	INC	HES	
DIM	MIN	MAX	MIN	MAX	
Α	4.80	5.00	0.189	0.197	
В	3.80	4.00	0.150	0.157	
C	1.35	1.35 1.75		0.069	
D	0.33	0.51	0.013	0.020	
G	1.27	7 BSC	0.050 BSC		
Н	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	

SOLDERING FOOTPRINT*



^{*}For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

GENERIC MARKING DIAGRAM*



XXXXX = Specific Device Code = Assembly Location = Wafer Lot

= Year = Work Week = Pb-Free Package XXXXXX AYWW AYWW Ŧ \mathbb{H} Discrete **Discrete** (Pb-Free)

XXXXXX = Specific Device Code = Assembly Location Α

= Year ww = Work Week = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb–Free indicator, "G" or microdot "■", may or may not be present. Some products may not follow the Generic Marking.

STYLES ON PAGE 2

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DATE 16 FEB 2011

			27112 101 22 2
STYLE 1: PIN 1. EMITTER 2. COLLECTOR 3. COLLECTOR 4. EMITTER 5. EMITTER 6. BASE 7. BASE 8. EMITTER	STYLE 2: PIN 1. COLLECTOR, DIE, #1 2. COLLECTOR, #1 3. COLLECTOR, #2 4. COLLECTOR, #2 5. BASE, #2 6. EMITTER, #2 7. BASE, #1 8. EMITTER, #1	STYLE 3: PIN 1. DRAIN, DIE #1 2. DRAIN, #1 3. DRAIN, #2 4. DRAIN, #2 5. GATE, #2 6. SOURCE, #2 7. GATE, #1 8. SOURCE, #1	
STYLE 5: PIN 1. DRAIN 2. DRAIN 3. DRAIN 4. DRAIN 5. GATE 6. GATE 7. SOURCE 8. SOURCE	STYLE 6: PIN 1. SOURCE 2. DRAIN 3. DRAIN 4. SOURCE 5. SOURCE 6. GATE 7. GATE 8. SOURCE	STYLE 7: PIN 1. INPUT 2. EXTERNAL BYPASS 3. THIRD STAGE SOURCE 4. GROUND 5. DRAIN 6. GATE 3 7. SECOND STAGE Vd 8. FIRST STAGE Vd	STYLE 8: PIN 1. COLLECTOR, DIE #1 2. BASE, #1 3. BASE, #2 4. COLLECTOR, #2 5. COLLECTOR, #2 6. EMITTER, #2 7. EMITTER, #1 8. COLLECTOR, #1
STYLE 9: PIN 1. EMITTER, COMMON 2. COLLECTOR, DIE #1 3. COLLECTOR, DIE #2 4. EMITTER, COMMON 5. EMITTER, COMMON 6. BASE, DIE #2 7. BASE, DIE #1 8. EMITTER, COMMON	STYLE 10: PIN 1. GROUND 2. BIAS 1 3. OUTPUT 4. GROUND 5. GROUND 6. BIAS 2 7. INPUT 8. GROUND STYLE 14: PIN 1. N-SOURCE 2. N-GATE 3. P-SOURCE	STYLE 11: PIN 1. SOURCE 1 2. GATE 1 3. SOURCE 2 4. GATE 2 5. DRAIN 2 6. DRAIN 2 7. DRAIN 1 8. DRAIN 1	STYLE 12: PIN 1. SOURCE 2. SOURCE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN
STYLE 13: PIN 1. N.C. 2. SOURCE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN	STYLE 14: PIN 1. N-SOURCE 2. N-GATE 3. P-SOURCE 4. P-GATE 5. P-DRAIN 6. P-DRAIN 7. N-DRAIN 8. N-DRAIN	8. DHAIN 1 STYLE 15: PIN 1. ANODE 1 2. ANODE 1 3. ANODE 1 4. ANODE 1 5. CATHODE, COMMON 6. CATHODE, COMMON 7. CATHODE, COMMON 8. CATHODE, COMMON	STYLE 16: PIN 1. EMITTER, DIE #1 2. BASE, DIE #1 3. EMITTER, DIE #2 4. BASE, DIE #2 5. COLLECTOR, DIE #2 6. COLLECTOR, DIE #2 7. COLLECTOR, DIE #1 8. COLLECTOR, DIE #1
STYLE 17: PIN 1. VCC 2. V2OUT 3. V1OUT 4. TXE 5. RXE 6. VEE 7. GND 8. ACC	STYLE 18: PIN 1. ANODE 2. ANODE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. CATHODE 8. CATHODE	STYLE 19: PIN 1. SOURCE 1 2. GATE 1 3. SOURCE 2 4. GATE 2 5. DRAIN 2 6. MIRROR 2 7. DRAIN 1 8. MIRROR 1	STYLE 20: PIN 1. SOURCE (N) 2. GATE (N) 3. SOURCE (P) 4. GATE (P) 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN
6. VEE 7. GND 8. ACC STYLE 21: PIN 1. CATHODE 1 2. CATHODE 2 3. CATHODE 3 4. CATHODE 4 5. CATHODE 5 6. COMMON ANODE 7. COMMON ANODE 8. CATHODE 6	STYLE 22: PIN 1. I/O LINE 1 2. COMMON CATHODE/VCC 3. COMMON CATHODE/VCC 4. I/O LINE 3 5. COMMON ANODE/GND 6. I/O LINE 4 7. I/O LINE 5 8. COMMON ANODE/GND	STYLE 23: PIN 1. LINE 1 IN 2. COMMON ANODE/GND 3. COMMON ANODE/GND 4. LINE 2 IN 5. LINE 2 OUT 6. COMMON ANODE/GND 7. COMMON ANODE/GND 8. LINE 1 OUT	a COLLECTOR/ANODE
STYLE 25: PIN 1. VIN 2. N/C 3. REXT 4. GND 5. IOUT 6. IOUT 7. IOUT 8. IOUT	STYLE 26: PIN 1. GND 2. dv/dt 3. ENABLE 4. ILIMIT 5. SOURCE 6. SOURCE 7. SOURCE 8. VCC	STYLE 27: PIN 1. ILIMIT 2. OVLO 3. UVLO 4. INPUT+ 5. SOURCE 6. SOURCE 7. SOURCE 8. DRAIN	STYLE 28: PIN 1. SW_TO_GND 2. DASIC_OFF 3. DASIC_SW_DET 4. GND 5. V_MON 6. VBULK 7. VBULK 8. VIN
STYLE 29: PIN 1. BASE, DIE #1 2. EMITTER, #1 3. BASE, #2 4. EMITTER, #2 5. COLLECTOR, #2 6. COLLECTOR, #2 7. COLLECTOR, #1 8. COLLECTOR, #1	STYLE 30: PIN 1. DRAIN 1 2. DRAIN 1 3. GATE 2 4. SOURCE 2 5. SOURCE 1/DRAIN 2 6. SOURCE 1/DRAIN 2 7. SOURCE 1/DRAIN 2 8. GATE 1		

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 NL17SZ00P5T5G
 NL17SH02P5T5G
 74AUP2G00RA3-7

 NLV74HC02ADTR2G
 NLX1G332CMUTCG
 NL17SG86P5T5G
 NL17SZ05P5T5G
 NLV74VHC00DTR2G