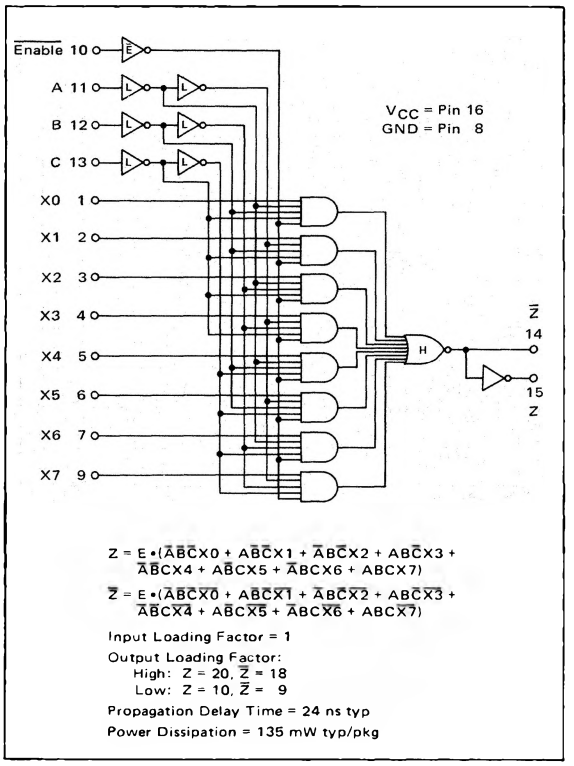
8-CHANNEL
DATA SELECTOR

MC9312L*
MC8312L,P*



$Z = E \cdot (\overline{A}\overline{B}\overline{C}X0 + A\overline{B}\overline{C}X1 + \overline{A}B\overline{C}X2 + AB\overline{C}X3 + \overline{A}\overline{B}CX4 + A\overline{B}CX5 + \overline{A}BCX6 + ABCX7)$

$\overline{Z} = E \cdot (\overline{A}\overline{B}\overline{C}\overline{X0} + A\overline{B}\overline{C}\overline{X1} + \overline{A}B\overline{C}\overline{X2} + AB\overline{C}\overline{X3} + \overline{A}\overline{B}C\overline{X4} + A\overline{B}C\overline{X5} + \overline{A}BC\overline{X6} + ABC\overline{X7})$

Input Loading Factor = 1

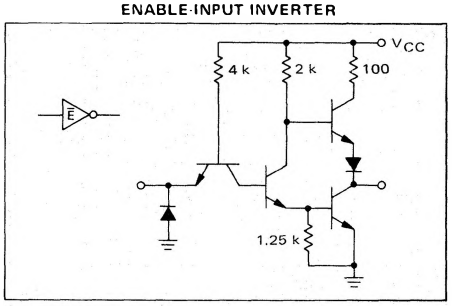
Output Loading Factor:
High: Z = 20, $\overline{Z}$ = 18
Low: Z = 10, $\overline{Z}$ = 9

Propagation Delay Time = 24 ns typ

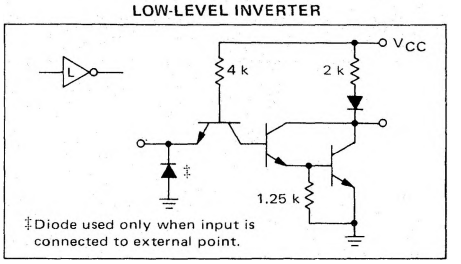
Power Dissipation = 135 mW typ/pkg

This 8-channel data selector is constructed from high-level and low-level gates interconnected as shown in the logic diagram. It is a logical implementation of a single pole, eight position switch with the switch position controlled by the state of the select inputs, A, B, and C. Complementary outputs are provided. The $\overline{\text{Enable}}$ input is active in the low state. When the $\overline{\text{Enable}}$ input is high, the $\overline{Z}$ output is high and the Z output low, regardless of the state of the other inputs.

ENABLE-INPUT INVERTER

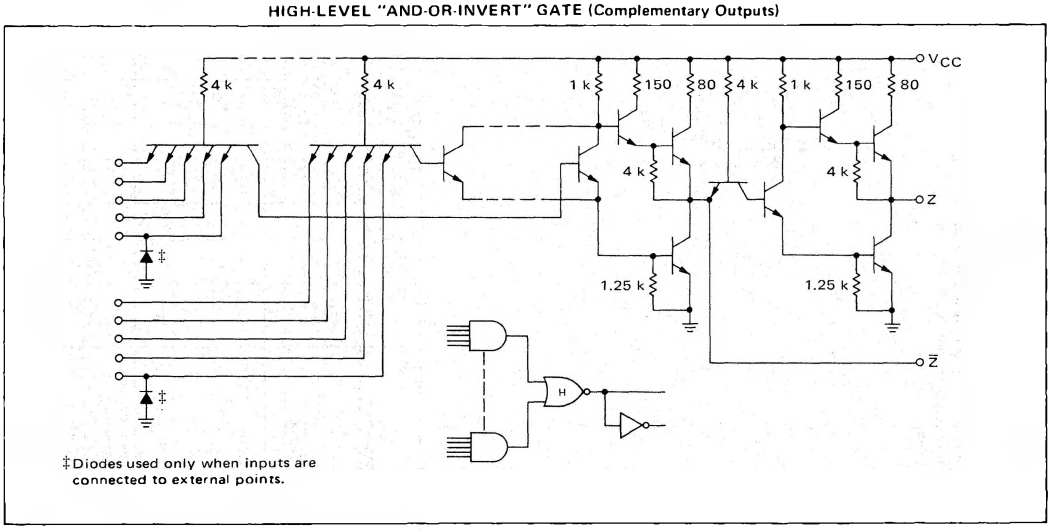


LOW-LEVEL INVERTER



‡Diode used only when input is connected to external point.

HIGH-LEVEL "AND-OR-INVERT" GATE (Complementary Outputs)

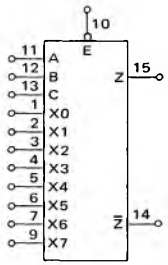


‡Diodes used only when inputs are connected to external points.

*L suffix = 16-pin dual in-line ceramic package (Case 620).
P suffix = 16-pin dual in-line plastic package (Case 612).

ELECTRICAL CHARACTERISTICS

Test procedures are shown for only one input and one output. Test other inputs and outputs in a similar manner according to the truth table. Additionally, test all input-output combinations according to the truth table.



TRUTH TABLE

E	C	B	A	X0	X1	X2	X3	X4	X5	X6	X7	Z̄	Z
1	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	1	0
0	0	0	0	0	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	1	0
0	0	0	0	1	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	0	1
0	0	0	1	ϕ	0	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	1	0
0	0	0	1	ϕ	1	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	0	1
0	0	1	0	ϕ	ϕ	0	ϕ	ϕ	ϕ	ϕ	ϕ	1	0
0	0	1	0	ϕ	ϕ	1	ϕ	ϕ	ϕ	ϕ	ϕ	0	1
0	0	1	1	ϕ	ϕ	ϕ	0	ϕ	ϕ	ϕ	ϕ	1	0
0	0	1	1	ϕ	ϕ	ϕ	1	ϕ	ϕ	ϕ	ϕ	0	1
0	1	0	0	ϕ	ϕ	ϕ	ϕ	0	ϕ	ϕ	ϕ	1	0
0	1	0	0	ϕ	ϕ	ϕ	ϕ	1	ϕ	ϕ	ϕ	0	1
0	1	0	1	ϕ	ϕ	ϕ	ϕ	ϕ	0	ϕ	ϕ	1	0
0	1	0	1	ϕ	ϕ	ϕ	ϕ	ϕ	1	ϕ	ϕ	0	1
0	1	1	0	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	0	ϕ	1	0
0	1	1	0	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	1	ϕ	0	1
0	1	1	1	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	0	1	0
0	1	1	1	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	ϕ	1	0	1

ϕ = Input level does not affect output.

	@ Test Temperature	TEST CURRENT/VOLTAGE VALUES mA I_{OL1}	I_{OL2}	I_{OL3}	I_{OL4}	I_{OH1}	I_{OH2}	I_D	Volts V_{IL}	V_{IH}	V_F	V_R	V_{CC}	V_{CCL}	V_{CCH}	V_{IHX}
MC9312	-55°C	11.2	12.4	14.4	16.0	-1.2	-1.08	–	0.80	2.0	0.4	–	5.0	4.5	5.5	–
MC9312	+25°C	11.2	12.4	14.4	16.0	-1.2	-1.08	-10	0.90	1.7	0.4	4.5	5.0	4.5	5.5	2.4
MC9312	+125°C	11.2	12.4	14.4	16.0	-1.2	-1.08	–	0.80	1.4	0.4	4.5	5.0	4.5	5.5	–
MC8312	0°C	12.7	14.1	14.4	16.0	-1.2	-1.08	–	0.85	1.9	0.45	–	5.0	4.75	5.25	–
MC8312	+25°C	12.7	14.1	14.4	16.0	-1.2	-1.08	-10	0.85	1.8	0.45	4.5	5.0	4.75	5.25	2.4
MC8312	+75°C	12.7	14.1	14.4	16.0	-1.2	-1.08	–	0.85	1.6	0.45	4.5	5.0	4.75	5.25	–

Characteristic	Symbol	Pin Under Test	MC9312 Test Limits -55°C Min	-55°C Max	+25°C Min	+25°C Max	+125°C Min	+125°C Max	MC8312 Test Limits 0°C Min	0°C Max	+25°C Min	+25°C Max	+75°C Min	+75°C Max	Unit	TEST CURRENT/VOLTAGE APPLIED TO PINS LISTED BELOW: I_{OL1}	I_{OL2}	I_{OL3}	I_{OL4}	I_{OH1}	I_{OH2}	I_D	V_{IL}	V_{IH}	V_F	V_R	V_{CC}	V_{CCL}	V_{CCH}	V_{IHX}	Gnd
Input																														
Forward Current	I_{F1}	1	–	-1.6	–	-1.6	–	-1.6	–	-1.6	–	-1.6	–	-1.6	mAdc	–	–	–	–	–	–	–	–	1	–	–	–	–	16	–	8,10,11,12,13
	I_{F2}	1	–	-1.24	–	-1.24	–	-1.24	–	-1.41	–	-1.41	–	-1.41	mAdc	–	–	–	–	–	–	–	–	1	–	–	–	16	–	–	8,10,11,12,13
Leakage Current	I_R	1	–	–	–	60	–	60	–	–	–	60	–	60	μAdc	–	–	–	–	–	–	–	–	–	–	1	–	–	16	–	8
Clamp Voltage	V_D	1	–	–	–	-1.5	–	–	–	–	–	-1.5	–	–	Vdc	–	–	–	–	–	–	1	–	–	–	–	16	–	–	–	8
Output																														
Output Voltage	V_{OL1}	14	–	0.4	–	0.4	–	0.4	–	0.45	–	0.45	–	0.45	Vdc	14	–	–	–	15	–	–	10,11,12,13	1	–	–	–	16	–	–	8
		15	–	0.4	–	0.4	–	0.4	–	0.45	–	0.45	–	0.45	Vdc	–	15	–	–	–	14	–	1,10,11,12,13	–	–	–	–	16	–	–	8
	V_{OL2}	14	–	0.4	–	0.4	–	0.4	–	0.45	–	0.45	–	0.45	Vdc	–	–	14	–	15	–	–	10,11,12,13	1	–	–	–	–	16	–	8
		15	–	0.4	–	0.4	–	0.4	–	0.45	–	0.45	–	0.45	Vdc	–	–	–	15	–	14	–	1,10,11,12,13	–	–	–	–	–	16	–	8
	V_{OR}	14	2.4	–	2.4	–	2.4	–	2.4	–	2.4	–	2.4	–	Vdc	–	–	–	15	–	14	–	1,10,11,12,13	–	–	–	–	16	–	–	8
		15	2.4	–	2.4	–	2.4	–	2.4	–	2.4	–	2.4	–	Vdc	–	–	14	–	15	–	–	10,11,12,13	1	–	–	–	16	–	–	8
Power Requirements (Total Device)																														
Power Supply Drain	I_{PDH}	16	–	40	–	40	–	40	–	43	–	43	–	43	mAdc	–	–	–	–	–	–	–	–	–	–	–	16	–	–	–	8
Switching Parameters																Pulse In		Pulse Out												
Turn-On Delay	t_{pd-}	11/15	–	–	–	36	–	–	–	–	–	36	–	–	ns	11		16		–	–	–	–	16	–	–	16	–	–	2,3,4,5,6,7,9	1,8,10,12,13
Turn-Off Delay	t_{pd+}	11/15	–	–	–	34	–	–	–	–	–	34	–	–	ns	11		15		–	–	–	–	16	–	–	16	–	–	2,3,4,5,6,7,9	1,8,10,12,13

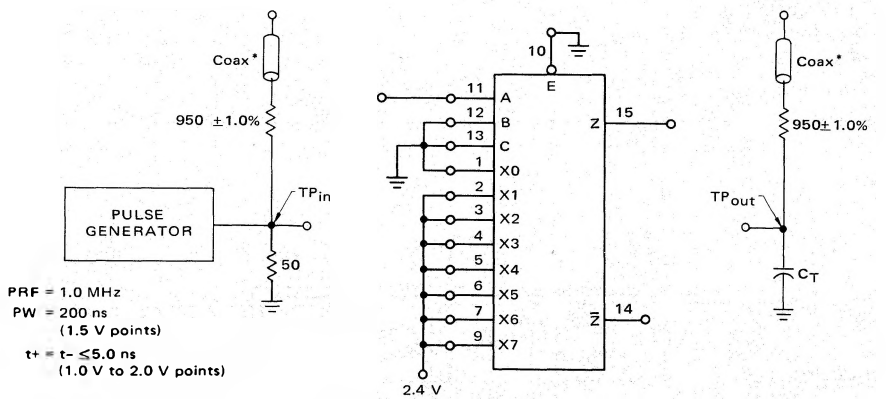
INPUT and OUTPUT LOADING FACTORS
with respect to MTTL and MDTL families

FAMILY	MC9312 INPUT LOADING FACTOR	MC9312 OUTPUT LOADING FACTOR Z	MC9312 OUTPUT LOADING FACTOR $\bar{Z}$
MC9300	1.0	10	9.0
MC500	1.06	10.6	9.5
MC2100	0.7	7.0	6.3
MC3100	0.7	7.0	6.3
MC4300	1.0	10	9.0
MC5400	1.0	7.75	7.0
MC930*	Fan-Out = 2 (6.0 k ohm pullup) Fan-Out = 8 (2.0 k ohm pullup)	9.4	8.4

*Due to logic "1" state drive limitations of the MDTL family.

FAMILY	MC8312 INPUT LOADING FACTOR	MC8312 OUTPUT LOADING FACTOR Z	MC8312 OUTPUT LOADING FACTOR $\bar{Z}$
MC8300	1.0	10	9.0
MC400	1.0	9.0	8.1
MC2000	0.6	6.0	5.4
MC3000	0.7	7.4	6.6
MC4000	1.0	10	9.0
MC7400	1.0	8.75	7.8
MC830*	Fan-Out = 2 (6.0 k ohm pullup) Fan-Out = 8 (2.0 k ohm pullup)	10.8	9.7

SWITCHING TIME TEST CIRCUIT AND VOLTAGE WAVEFORMS



**The coax delays from input to scope and output to scope must be matched. The scope must be terminated in 50-ohm impedance. The 950-ohm resistor and the scope termination impedance constitute a 20:1 attenuator probe. Coax shall be CT-070-50 or equivalent.

C_T = 15 pF = total parasitic capacitance, which includes probe and wiring capacitances.