MµL9030

8-BIT MEMORY CELL

MEMORY MICROLOGIC® INTEGRATED CIRCUITS

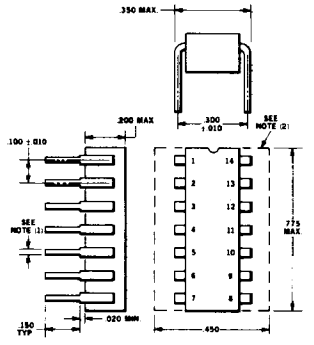
GENERAL DESCRIPTION - The MµL9030 is a Planar* epitaxial integrated 8-bit (non-destructive readout) memory cell consisting of four 2-bit words. The cell is addressable by word. It is permissible to write into one word while reading another. The same information may also be written in two words simultaneously. The "Write" time for a cell is 45 nanoseconds maximum and the "Read" delay is 25 nanoseconds.

The element is fully compatible with Fairchild CTµL Circuits. The "Read" and "Data" inputs are the equivalent of 1.5 CTµL gate loads, and the "Write" inputs, 3 CTµL gate loads. The outputs can drive 3 CTµL gate loads.

For applications where faster "Readout" speed is essential, the users are encouraged to investigate the properties of the CTµL968 Integrated Dual Latch.

*Planar is a Patented Fairchild Process.

TYPICAL DUAL IN-LINE PACKAGE

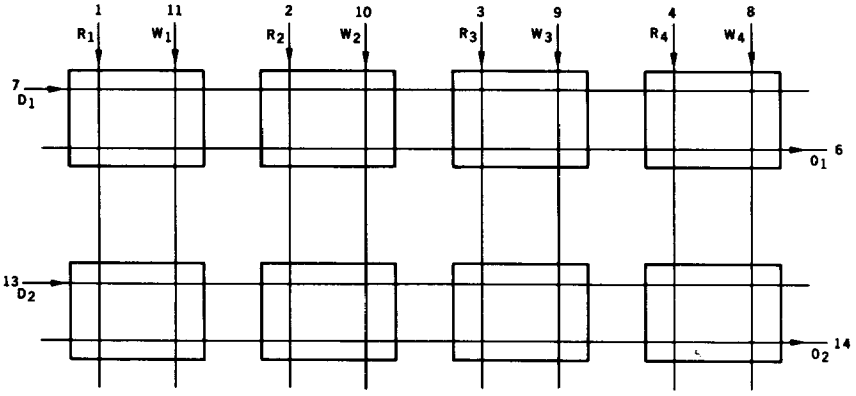


NOTES:
1. Leads are a modified hexagon in cross section. Board-drilling dimensions should equal your practice for a conventional .020 inch diameter lead.
2. Max. envelope for all planned packages of this design family.

LOGIC DIAGRAM AND PIN ARRANGEMENTS

D_1, D_2: DATA INPUTS
R_1, R_2, R_3, R_4: READ INPUTS
W_1, W_2, W_3, W_4: WRITE INPUTS
O_1, O_2: OR–ABLE OUTPUTS

V_{CC} = PIN 12
GND = PIN 5



313 FAIRCHILD DRIVE, MOUNTAIN VIEW, CALIFORNIA, (415) 962-5011, TWX: 910-379-6435

FAIRCHILD SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

D.C. TESTS (V_{CC} = 4.5 V, T = 25°C)

DESCRIPTION	TEST	CONDITIONS	LIMITS MIN	LIMITS MAX	UNITS	EQUIV CTμL LOAD
Read Input Current	I_1, I_2, I_3, I_4	V_1, V_2, V_3, V_4 = 2.5 V		4.4	mA ea.	1.5
Data Input Current	I_7, I_{13}	V_7, V_{13} = 2.5 V		4.4	mA ea.	1.5
Write Input Current	I_8, I_9, I_{10}, I_{11}	V_8, V_9, V_{10}, V_{11} = 2.5 V		8.8	mA ea.	3
Output Voltage (High State)	V_6, V_{14}	I_6, I_{14} = -10 mA	2.35		V	
Output Voltage (Low State)	V_6, V_{14}	I_6, I_{14} = -1 mA		-0.36	V	
Output Leakage	I_6, I_{14}	V_6, V_{14} = 4 V		5	μA	
Output Capacitance	C_6, C_{14}	V_6, V_{14} = 0 Boonton Bridge		8	pF	

INPUT LEVEL: Maximum permissible "low" level = 0.8 V. Maximum required "high" level: 1.25 V.

RECOMMENDED OPERATING CONDITIONS:

The above test specifications characterize the terminal properties of the circuit under one set of conditions. They in no way limit the circuit to be used under different conditions where certain advantages may be achieved. In general, excessive heat generated in the circuit presents the largest factor in degrading the performance of the circuit. For noise immunity greater than 0.5 V and operating speed within 20% of 25°C speed, junction temperature must be kept within 0-125°C. The circuit dissipates 350 mW with V_{CC} = 4.5 V ± 10% and full load. (F/O = 3 CTμL Gates.)

Maximum thermal resistances of the package from junction to air are:

100°C/W in still air 65°C/W with 200 feet/min air flow 50°C/W with 400 feet/min air flow

For example, the circuit may be operated in still air at T_A = 90°C with V_{CC} = 4.5 V ±10%. Higher ambient temperatures are possible in moving air, as can be calculated from the data above.

The outputs of the MμL9030 may be "OR-ed" with the outputs of different words. Each output terminal represents 8 pF capacitance and 5 μA leakage current. The limit on OR-tying outputs is the degradation of switching speed that the user can tolerate due to added capacitance.

Fan-out of the MμL9030 can be increased to 15 with only a slight increase in delay by buffering with the CTμL965.

SWITCHING TIME:

Load Resistance: 1 k to -2 V — Load Capacitance: 10 pF probe and jig capacitance — Input waveform rise and fall time: 6 ns

These tests are for correlations only. While t_1 through t_4 do not change with varied loads, t_5, t_6, and t_7 may differ under different output loading conditions.

SWITCHING TIME:

t_1: 25 ns MIN.
t_2: 10 ns MIN.
t_3: 10 ns MIN.
t_4: 10 ns MIN.
t_5: 25 ns MAX.
t_6: 25 ns MAX.
t_7: 25 ns MIN.

NOTE:
1) DOTTED LINES REPRESENT CELL STORING "LOW" LEVEL.
2) t_7 REPRESENTS TIME INTERVAL BETWEEN READ PULSES FOR ERROR-FREE READOUT.