MOTOROLA

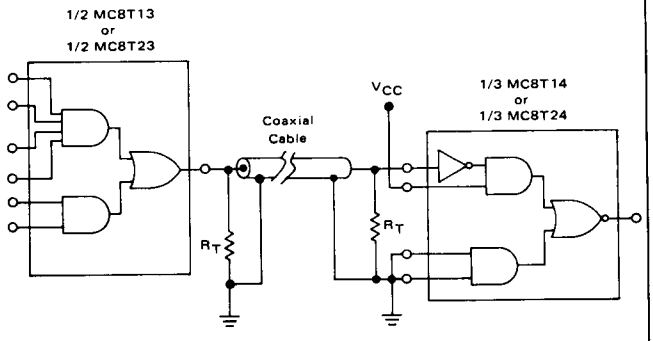
MC8T13
MC8T23

DUAL LINE DRIVERS

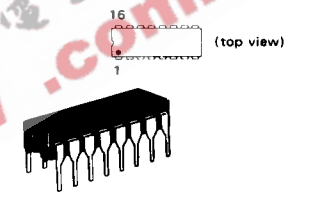
The MC8T13 and MC8T23 are designed to drive transmission lines with impedances of 50 Ω to 500 Ω. The MC8T23 specifically meets all of the input/output requirements of the IBM System 360/System 370 specifications (IBM Specification GA 22-6974-0).

- High Output Drive Capability –
  I_O = -75 mA (Min) @ V_O = 2.4 V – MC8T13
  I_O = -59.3 mA (Min) @ V_O = 3.11 V – MC8T23
- High Speed Operation –
  t_{PLH} = t_{PHL} = 20 ns (Max) with 50 Ω Load
- MTTL and MDTL Compatible Inputs
- Uncommitted Emitter Output Structures Permit Party-Line Operation
- Designed to Operate with MC8T14 or MC8T24 Line Receivers
- Outputs are Short-Circuit Protected
- Equivalent to SN75121 and SN75123 Respectively.

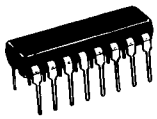
TYPICAL APPLICATION



DUAL LINE DRIVERS
SILICON MONOLITHIC
INTEGRATED CIRCUIT

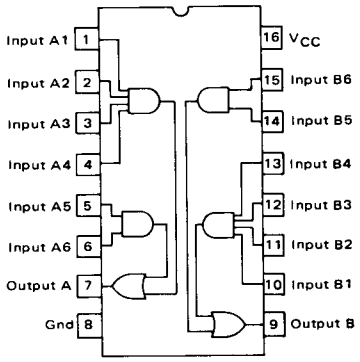


L SUFFIX
CERAMIC PACKAGE
CASE 620



P SUFFIX
PLASTIC PACKAGE
CASE 648

PIN CONNECTIONS



TRUTH TABLE

Inputs						Output
1	2	3	4	5	6	
H	H	H	H	X	X	H
X	X	X	X	H	H	H
All Other Combinations						L

H = High Logic State
L = Low Logic State
X = Irrelevant

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MAXIMUM RATINGS (T_A = +25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V_{CC}	7.0	Vdc
Input Voltage	V_I	5.5	Vdc
Output Voltage	V_O	7.0	Vdc
Power Dissipation @ T_A = +25°C Derate above 25°C	P_D	1000 6.7	mW mW/°C
Operating Ambient Temperature Range	T_A	0 to +75	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C

ELECTRICAL CHARACTERISTICS (Unless otherwise noted, 4.75 V ≤ V_{CC} ≤ 5.25 V and 0°C ≤ T_A ≤ 75°C)

Characteristics	Symbol	MC8T13 Min	MC8T13 Typ	MC8T13 Max	MC8T23 Min	MC8T23 Typ	MC8T23 Max	Unit
Input Voltage – Low Logic State	V_{IL}	–	–	0.8	–	–	0.8	V
Input Voltage – High Logic State	V_{IH}	2.0	–	–	2.0	–	–	V
Input Current – Low Logic State (V_{IL} = 0.4 V)	I_{IL}	-0.1	–	-1.6	-0.1	–	-1.6	mA
Input Current – High Logic State (V_{IH} = 4.5 V)	I_{IH1}	–	–	40	–	–	40	μA
(V_{IH} = 5.5 V, V_{CC} = 5.0 V)	I_{IH2}	–	–	10	–	–	10	mA
Input Clamp Voltage (I_I = -12 mA, V_{CC} = 5.0 V)	$V_{I(clamp)}$	–	–	-1.5	–	–	-1.5	V
Output Voltage – High Logic State (V_{IH} = 2.0 V, I_{OH} = -75 mA)	V_{OH1}	2.4	–	–	–	–	–	V
(V_{CC} = 5.0 V, V_{IH} = 2.0 V, I_{OH} = -59.3 mA) (T_A = 25°C)	V_{OH2}	– –	– –	– –	2.9 3.11	– –	– –	V
Output Current – High Logic State (V_{IH} = 4.5 V, V_{CC} = 5.0 V, V_O = 2.0 V, T_A = 25°C)	I_{OH}	-100	–	-250	-100	–	-250	mA
Output Current – Low Logic State (V_{IL} = 0.8 V, V_O = 0.4 V)	I_{OL1}	–	–	-800	–	–	–	μA
(V_{IL} = 0.8 V, V_O = 0.15 V)	I_{OL2}	–	–	–	–	–	-240	μA
Output Reverse Leakage Current – Low Logic State (V_{IL} = 0 V, V_O = 3.0 V)	I_{OR1}	–	–	80	–	–	–	μA
(V_{IL} = 0 V, V_O = 3.0 V, V_{CC} = 0 V)	I_{OR2}	–	–	500	–	–	40	μA
Output Short-Circuit Current (V_{IH} = 4.5 V, V_{CC} = 5.0 V, V_O = 0 V, T_A = 25°C)	I_{OS}	–	–	-30	–	–	-30	mA
Power Supply Currents (I_O = 0 mA) Outputs – Low Logic State, V_{IL} = 0.8 V	I_{CCL}	–	–	60	–	–	60	mA
Outputs – High Logic State, V_{IH} = 2.0 V	I_{CCH}	–	–	28	–	–	28	mA

SWITCHING CHARACTERISTICS (V_{CC} = 5.0 V, T_A = 25°C unless otherwise noted.) Figure 1

Characteristic	Symbol	MC8T13 Min	MC8T13 Typ	MC8T13 Max	MC8T23 Min	MC8T23 Typ	MC8T23 Max	Unit
Propagation Delay Time – Low to High Level Output	t_{PLH}							ns
(R_L = 37 Ω, C_L = 15 pF)		–	11	20	–	–	–	
(R_L = 37 Ω, C_L = 1000 pF)		–	22	50	–	–	–	
(R_L = 50 Ω, C_L = 15 pF)		–	–	–	–	12	20	
(R_L = 50 Ω, C_L = 100 pF)		–	–	–	–	20	35	
Propagation Delay Time – High to Low Level Output	t_{PHL}							ns
(R_L = 37 Ω, C_L = 15 pF)		–	8.0	20	–	–	–	
(R_L = 37 Ω, C_L = 1000 pF)		–	20	50	–	–	–	
(R_L = 50 Ω, C_L = 15 pF)		–	–	–	–	12	20	
(R_L = 50 Ω, C_L = 100 pF)		–	–	–	–	15	25	

FIGURE 1 – SWITCHING TEST CIRCUIT AND WAVEFORMS

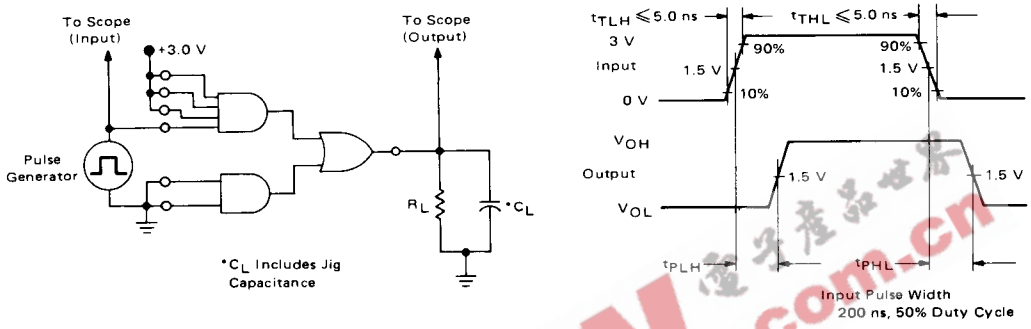

FIGURE 2 – REPRESENTATIVE SCHEMATIC DIAGRAM
(1/2 Shown)

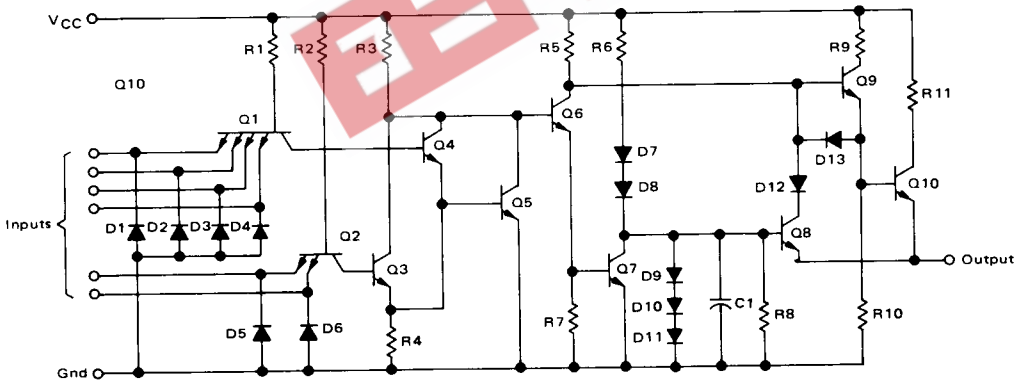

FIGURE 3 – TYPICAL OUTPUT CURRENT
versus OUTPUT VOLTAGE