



**MOTOROLA**

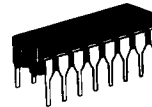
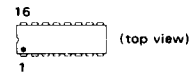
**MC8T13  
MC8T23**

**DUAL LINE DRIVERS**

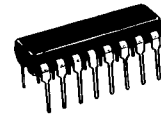
The MC8T13 and MC8T23 are designed to drive transmission lines with impedances of 50  $\Omega$  to 500  $\Omega$ . The MC8T23 specifically meets all of the input/output requirements of the IBM System 360/System 370 specifications (IBM Specification GA 22-6974-0).

- High Output Drive Capability –  
 $I_O = -75 \text{ mA (Min) @ } V_O = 2.4 \text{ V} - \text{MC8T13}$   
 $I_O = -59.3 \text{ mA (Min) @ } V_O = 3.11 \text{ V} - \text{MC8T23}$
- High Speed Operation –  
 $t_{PLH} = t_{PHL} = 20 \text{ ns (Max) with } 50 \Omega \text{ Load}$
- M TTL 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.

**DUAL LINE DRIVERS  
SILICON MONOLITHIC  
INTEGRATED CIRCUIT**



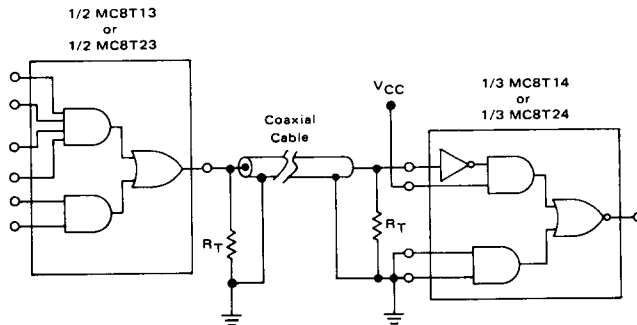
**L SUFFIX  
CERAMIC PACKAGE  
CASE 620**



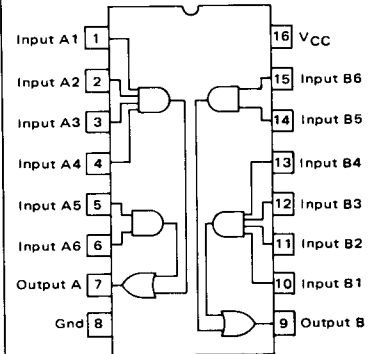
**P SUFFIX  
PLASTIC PACKAGE  
CASE 648**

5

**TYPICAL APPLICATION**



**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

# MC8T13, MC8T23

## MAXIMUM RATINGS (T<sub>A</sub> = +25°C unless otherwise noted.)

Rating	Symbol	Value	Unit
Power Supply Voltage	V <sub>CC</sub>	7.0	Vdc
Input Voltage	V <sub>I</sub>	5.5	Vdc
Output Voltage	V <sub>O</sub>	7.0	Vdc
Power Dissipation @ T <sub>A</sub> = +25°C Derate above 25°C	P <sub>D</sub>	1000 6.7	mW mW/°C
Operating Ambient Temperature Range	T <sub>A</sub>	0 to +75	°C
Storage Temperature Range	T <sub>stg</sub>	-65 to +150	°C

## ELECTRICAL CHARACTERISTICS (Unless otherwise noted, 4.75 V ≤ V<sub>CC</sub> ≤ 5.25 V and 0°C ≤ T<sub>A</sub> ≤ 75°C)

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

## SWITCHING CHARACTERISTICS (V<sub>CC</sub> = 5.0 V, T<sub>A</sub> = 25°C unless otherwise noted.) Figure 1

Characteristic	Symbol	MC8T13			MC8T23			Unit
		Min	Typ	Max	Min	Typ	Max	
Propagation Delay Time – Low to High Level Output (R <sub>L</sub> = 37 Ω, C <sub>L</sub> = 15 pF) (R <sub>L</sub> = 37 Ω, C <sub>L</sub> = 1000 pF) (R <sub>L</sub> = 50 Ω, C <sub>L</sub> = 15 pF) (R <sub>L</sub> = 50 Ω, C <sub>L</sub> = 100 pF)	t <sub>PLH</sub>	–	11	20	–	–	–	ns
		–	22	50	–	–	–	
		–	–	–	–	12	20	
		–	–	–	–	20	35	
Propagation Delay Time – High to Low Level Output (R <sub>L</sub> = 37 Ω, C <sub>L</sub> = 15 pF) (R <sub>L</sub> = 37 Ω, C <sub>L</sub> = 1000 pF) (R <sub>L</sub> = 50 Ω, C <sub>L</sub> = 15 pF) (R <sub>L</sub> = 50 Ω, C <sub>L</sub> = 100 pF)	t <sub>PHL</sub>	–	8.0	20	–	–	–	ns
		–	20	50	–	–	–	
		–	–	–	–	12	20	
		–	–	–	–	15	25	

# MC8T13, MC8T23

FIGURE 1 – SWITCHING TEST CIRCUIT AND WAVEFORMS

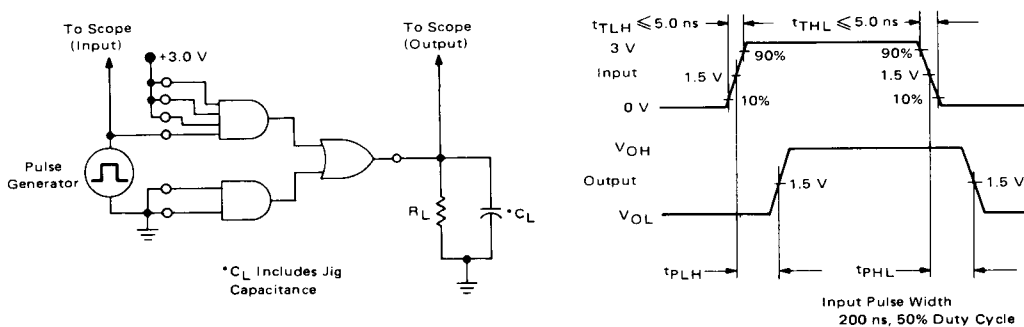


FIGURE 2 – REPRESENTATIVE SCHEMATIC DIAGRAM (1/2 Shown)

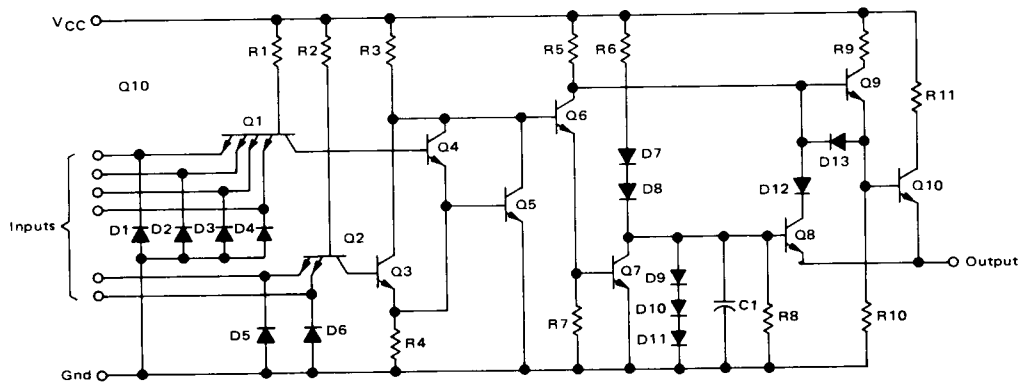
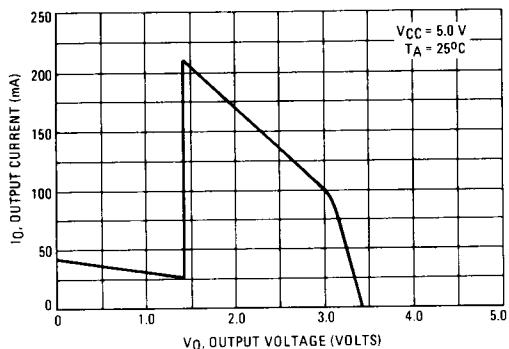


FIGURE 3 – TYPICAL OUTPUT CURRENT versus OUTPUT VOLTAGE



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