National Semiconductor

DM7223/DM8223 1-Line to 8-Line Demultiplexers

General Description

These circuits demultiplex a data train, and route the data to one of eight outputs. The binary code which is applied to three address lines determines which unique output receives the data. When the data input is at a logical "0," only the addressed output will be a logical "0." When the data input is at a logical "1," all outputs, and therefore the addressed output, will be at a logical "1."

Features

- Typical power dissipation 140 mW
- Typical propagation delay 25 ns

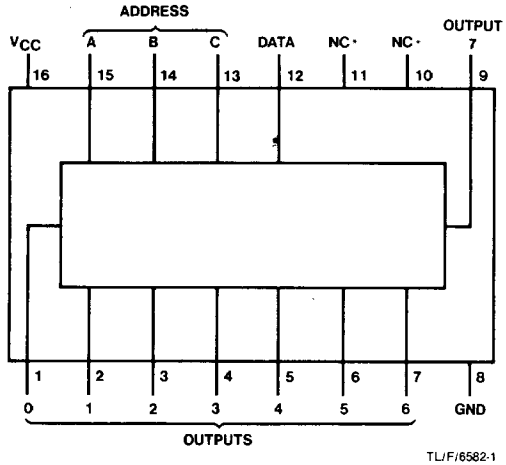
Absolute Maximum Ratings (Note 1)

Supply Voltage	7V
Input Voltage	5.5V
Storage Temperature Range	−65°C to 150°C

Note 1: The "Absolute Maximum Ratings" are those values beyond which the safety of the device can not be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.

Connection Diagram

Dual-In-Line Package



TL/F/6582-1

*Do not make connection to pins 10 or 11.

7223 (J) **8223 (N)**

Function Table

Data Input	Address Inputs			Outputs							
	C	B	A	0	1	2	3	4	5	6	7
L	L	L	L	L	H	H	H	H	H	H	H
L	L	L	H	H	L	H	H	H	H	H	H
L	L	H	L	H	H	L	H	H	H	H	H
L	L	H	H	H	H	H	L	H	H	H	H
L	H	L	L	H	H	H	H	L	H	H	H
L	H	L	H	H	H	H	H	H	L	H	H
L	H	H	L	H	H	H	H	H	H	L	H
L	H	H	H	H	H	H	H	H	H	H	L
H	X	X	X	H	H	H	H	H	H	H	H

X = Don't Care

Recommended Operating Conditions

Symbol	Parameter	DM7223			DM8223			Units
		Min	Nom	Max	Min	Nom	Max	
V_{CC}	Supply Voltage	4.5	5	5.5	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			2			V
V_{IL}	Low Level Input Voltage			0.8			0.8	V
I_{OH}	High Level Output Current			−0.4			−0.4	mA
I_{OL}	Low Level Output Current			16			16	mA
T_A	Free Air Operating Temperature	−55		125	0		70	°C

Electrical Characteristics over recommended operating free air temperature (unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −12 mA				−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max V_{IL} = Max, V_{IH} = Min		2.4			V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max V_{IH} = Min, V_{IL} = Max				0.4	V
I_I	Input Current@Max Input Voltage	V_{CC} = Max, V_I = 5.5V				1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.4V				40	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V				−1.6	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	DM72	−20		−55	mA
			DM82	−18		−57	
I_{CC}	Supply Current	V_{CC} = Max			28	41	mA

Switching Characteristics at V_{CC} = 5V and T_A = 25°C (See Section 1 for Test Waveforms and Output Load)

Parameter	Conditions	C_L = 15 pF, R_L = 400Ω			Units
		Min	Typ	Max	
t_{PLH} Propagation Delay Time Low to High Level Output			26	35	ns
t_{PHL} Propagation Delay Time High to Low Level Output			24	35	ns

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time.