Line Drivers/Receivers

DM7830/DM8830 dual differential line driver

general description

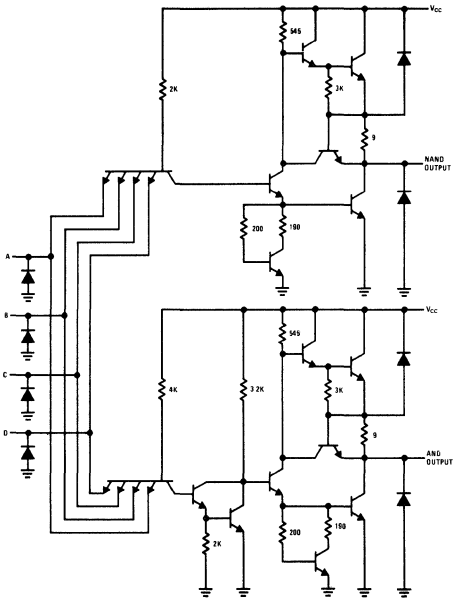
The DM7830/DM8830 is a dual differential line driver that also performs the dual four-input NAND or dual four-input AND function.

TTL (Transistor-Transistor-Logic) multiple emitter inputs allow this line driver to interface with standard TTL or DTL systems. The differential outputs are balanced and are designed to drive long lengths of coaxial cable, strip line, or twisted pair transmission lines with characteristic impedances of 50Ω to 500Ω. The differential feature of the output eliminates troublesome ground-loop errors normally associated with single-wire transmissions.

features

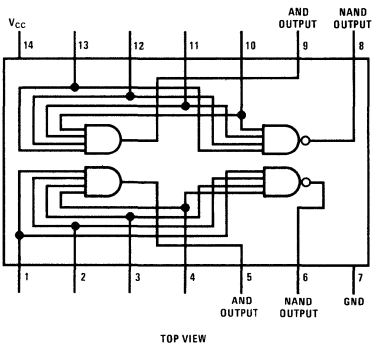
- Single 5 volt power supply
- Diode protected outputs for termination of positive and negative voltage transients
- Diode protected inputs to prevent line ringing
- High Speed
- Short Circuit Protection

schematic* and connection diagrams



*2 PER PACKAGE.

Dual-In-Line and Flat Package



TOP VIEW

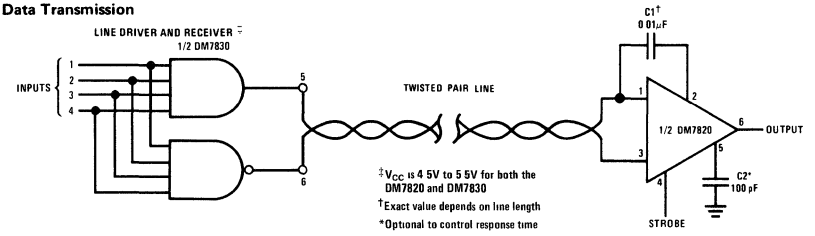
Order Number DM7830J or DM8830J
See Package 16

Order Number DM8830N
See Package 22

Order Number DM7830W or DM8830W
See Package 27

typical application

Digital Data Transmission



‡V_{CC} is 4.5V to 5.5V for both the DM7820 and DM7830

†Exact value depends on line length

*Optional to control response time

absolute maximum ratings

V_{CC}		7.0V
Input Voltage		5.5V
Operating Temperature	DM7830	−55°C to +125°C
	DM8830	0°C to 70°C
Storage Temperature		−65°C to +150°C
Lead Temperature (Soldering, 10 sec)		300°C
Output Short Circuit Duration (125°C)		1 second

electrical characteristics (Note 1)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Logical "1" Input Voltage		2.0			V
Logical "0" Input Voltage				0.8	V
Logical "1" Output Voltage	V_{IN} = 0.8V I_{OUT} = −0.8 mA	2.4			V
Logical "1"Output Voltage	V_{IN} = 0.8V I_{OUT} = 40 mA	1.8	3.3		V
Logical "0" Output Voltage	V_{IN} = 2.0V I_{OUT} = +32 mA		0.2	0.4	V
Logical "0" Output Voltage	V_{IN} = 2.0V I_{OUT} = +40 mA		0.22	0.5	V
Logical "1" Input Current	V_{IN} = +2.4V			120	μA
Logical "1" Input Current	V_{IN} = 5.5V			2	mA
Logical "0" Input Current	V_{IN} = 0.4V			4.8	mA
Output Short Circuit Current	V_{CC} = 5.0V T_A = 125°C	40	100	120	mA
Supply Current	V_{IN} = 5.0V (Each Driver)		11	18	mA
Propagation Delay AND Gate t_{pd1}	T_A = 25°C		8	12	ns
t_{pd0}	V_{CC} = 5.0V		11	18	ns
Propagation Delay NAND Gate t_{pd1}	C_L = 15 pF		8	12	ns
t_{pd0}	See Figure 1		5	8	ns
Differential Delay t_1	Load, 100Ω and 5000 pF		12	16	ns
Differential Delay t_2	See Figure 2		12	16	ns

Note 1: Specifications apply for DM7830 −55°C ≤ T_A ≤ +125°C, V_{CC} = +5V ±10%, DM8830 0°C ≤ T_A ≤ 70°C, V_{CC} = +5V ±5% unless otherwise stated. Typical values given are for T_A = 25°C, V_{CC} = 5.0V.

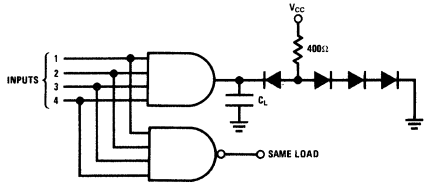


FIGURE 1.

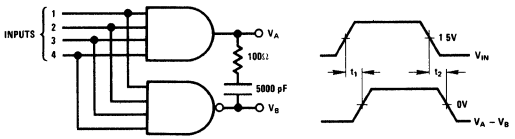
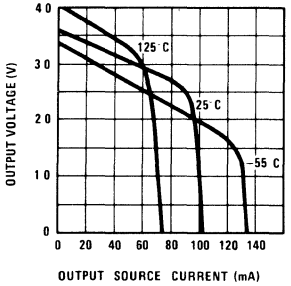


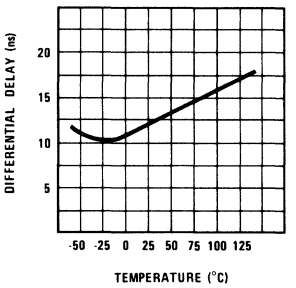
FIGURE 2.

typical performance characteristics

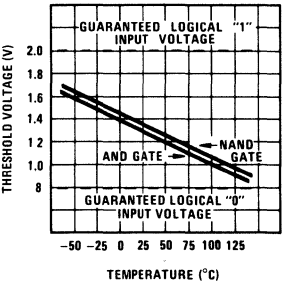
Output High Voltage (Logical "1") Vs Output Current



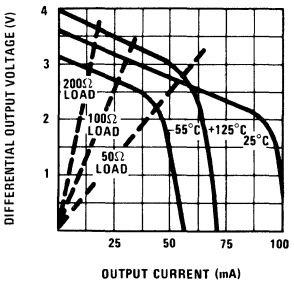
Differential Delay Vs Temperature



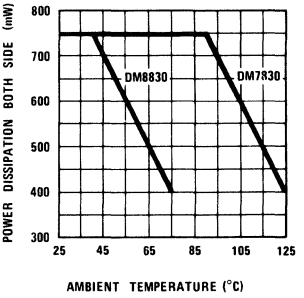
Threshold Voltage Vs Temperature



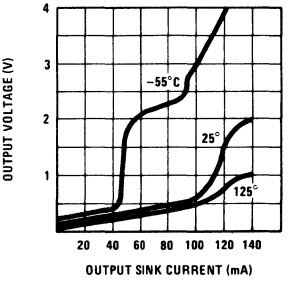
Differential Output Voltage ($|V_{AND} - V_{NAND}|$) Vs Differential Output Current



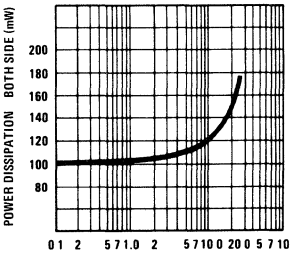
Maximum Power Dissipation



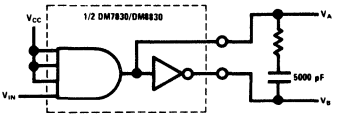
Output Low Voltage (Logical "0") Vs Output Current



Power Dissipation (No Load) Vs Data Input Frequency



ac test circuit



switching time waveforms