

## DUAL LINE RECEIVER

## DS7820/DS8820

## DESCRIPTION

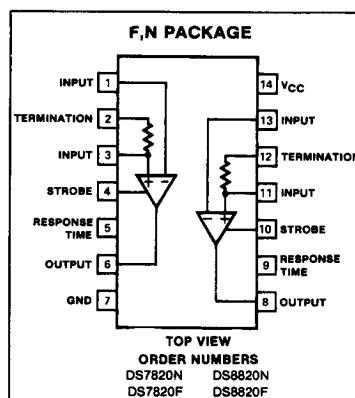
The DS7820, specified from  $-55^{\circ}\text{C}$  to  $125^{\circ}\text{C}$ , and the DS8820, specified from  $0^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ , are digital line receivers with two completely independent units fabricated on a single silicon chip. Intended for use with digital systems connected by twisted pair lines, they have a differential input designed to reject large common mode signals while responding to small differential signals. The output is directly compatible with RTL, DTL or TTL integrated circuits.

The response time can be controlled with an external capacitor to eliminate noise spikes, and the output state is determined for open inputs. Termination resistors for the twisted pair line are also included in the circuit. Both the DS7820 and the DS8820 are specified, worst case, over their full operating temperature range, for  $\pm 10$ -percent supply voltage variations and over the entire input voltage range.

## FEATURES

- Operation from a single +5V logic supply
- Input voltage range of  $\pm 15\text{V}$
- Independent channel strobing
- High input resistance
- Fanout of two with DTL or TTL
- Output can be wire OR'ed
- DS7820 MIL std 883A,B,C available

## PIN CONFIGURATION



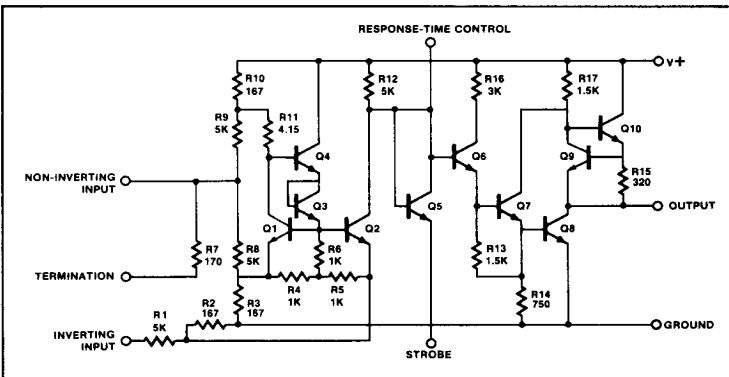
## ABSOLUTE MAXIMUM RATINGS

PARAMETER	RATING	UNIT
Supply voltage	8.0	V
Input voltage	$\pm 20$	V
Differential input voltage	$\pm 20$	V
Strobe voltage	8.0	V
Output sink current	25	mA
Power dissipation	600	mW
Operating temperature range		
DS7820	-55 to +125	°C
DS8820	0 to 70	°C
Lead temperature (soldering, 10sec)	300	°C

## NOTE

"Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. Except for "Operating Temperature Range" they are not meant to imply devices should be operated at these limits. The table of "Electrical Characteristics" provides conditions for actual device operation.

## CIRCUIT SCHEMATIC



Signetics

9-3

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## DC ELECTRICAL CHARACTERISTICS

Specifications apply for  $4.5V \leq V_{CC} \leq 5.5V$ ,  
 $-15V \leq V_{CM} \leq 15V$  and  $-55^\circ C \leq T_A \leq +125^\circ C$  for the DS7820  
 or  $0^\circ C \leq T_A \leq +70^\circ C$  for the DS8820 unless otherwise specified.  
 Typical values given are for  $V_{CC} = 5.0V$ ,  $T_A = 25^\circ C$  and  $V_{CM} = 0V$   
 unless stated differently. 1,2,3

PARAMETER	TEST CONDITIONS	DS7820			DS8820			UNIT
		Min	Typ	Max	Min	Typ	Max	
$V_{TH}$ $V_{TH}$	Input threshold Input threshold	$V_{IN} = 0V$ $-15V \leq V_{IN} \leq 15V$	-0.5 -1.0	0 0	0.5 1.0	-0.5 -1.0	0 0	0.5 1.0
$V_{OH}$ $V_{OL}$	High output level Low output level	$I_{OUT} \leq -0.2mA$ $I_{SINK} \leq 3.5mA$	2.5 0		5.5 0.4	2.5 0		5.5 0.4
$R_{IN} -$ $R_{IN} +$ $R_T$	Inverting input resistance Noninverting input resistance Line termination resistance		3.6 1.8 120	5.0 2.5 170	250	3.6 1.8 120	5.0 2.5 170	250
$I_{ST}$ $I_{ST}$	Strobe current Strobe current	$V_{Strobe} = 0.4V$ $V_{Strobe} = 5.5V$		1.0 -5	1.4 -5		1.0 -5	1.4 -5
$I_{CC}$ $I_{CC}$ $I_{CC}$	Supply current <sup>3</sup> Supply current <sup>3</sup> Supply current <sup>3</sup>	$V_{IN} = 15V$ $V_{IN} = 0V$ $V_{IN} = -15V$		3.2 5.8 8.3	6.0 10.2 15.0		3.2 5.8 8.3	6.0 10.2 15.0
$I_{IN+}$ $I_{IN+}$ $I_{IN+}$	Noninverting input current Noninverting input current Noninverting input current	$V_{IN} = 15V$ $V_{IN} = 0V$ $V_{IN} = -15V$		-1.6 -9.8	3.0 -1.0 -7.0	7.0	-1.6 -9.8	5.0 -1.0 -7.0
$I_{IN-}$ $I_{IN-}$ $I_{IN-}$	Inverting input current Inverting input current Inverting input current	$V_{IN} = 15V$ $V_{IN} = 0V$ $V_{IN} = -15V$		-4.2	3.0 0 -3.0	4.2 -0.5 -4.2	3.0 0 -3.0	4.2 -0.5 -3.0

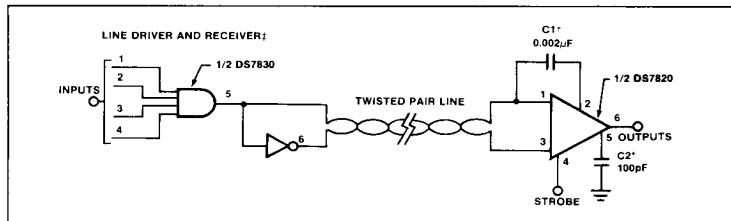
## NOTES

- All currents into device pins shown as positive, out of device pins as negative, all voltages referenced to ground unless otherwise noted. All values shown as max or min on absolute value basis.
- Only one output at a time should be shorted.
- The specifications and curves given are for one side only. Therefore, the total package dissipation and supply currents will be double the values given when both receivers are operated under identical conditions.

## AC ELECTRICAL CHARACTERISTICS

PARAMETER	TEST CONDITIONS	DS7820			DS8820			UNIT
		Min	Typ	Max	Min	Typ	Max	
$T_R$	$T_R$ Response time	$C_{delay} = 0$	40	150		40	150	ns
$T_R$	$T_R$ Response time	$C_{delay} = 100pF$						ns

## DS7820-DS8820 TYPICAL APPLICATION



†Exact value depends on line length

‡ $V_{CC}$  is 4.5V to 5.5V for both the DS7820 and DS7830

\*Optional to control response time