DS9627

DS9627 Dual Line Receiver

February 1996

National *Semiconductor*

DS9627
# Dual Line Receiver

General Description

The DS9627 is a dual-line receiver which meets the electrical interface specifications of EIA RS-232C and MIL-STD-188C. The input circuitry accommodates ±25V input signals and the differential inputs allow user selection of either inverting or non-inverting logic for the receiver operation. The DS9627 provides both a selectable hysteresis range and selectable receiver input resistance. When pin 1 is tied to V^-, the typical switching points are at 2.6V and −2.6V, thus meeting RS-232-C requirements. When pin 1 is open, the typical switching points are at 50 µA and −50 µA, thus satisfying the requirements of MIL-STD-188C LOW level interface. Connecting the RA and/or RB pins to the (−) input yields an input impedance in the range of 3 kΩ to 7 kΩ and satisfies RS-232-C requirements; leaving RA and/or RB pins unconnected, the input resistance will be greater than 6 kΩ to satisfy MIL-STD-188C.

The output circuitry is TTL/DTL compatible and will allow "collector-dotting" to generate the wired-OR function. A TTL/DTL strobe is also provided for each receiver.

Features

■ EIA RS-232-C input standards
■ MIL-STD-188C input standards
■ Variable hysteresis control
■ High common mode rejection
■ R control (5 kΩ or 10 kΩ)
■ Wired-OR capability
■ Choice of inverting and non-inverting inputs
■ Outputs and strobe TTL compatible

Connection Diagram

16-Lead DIP
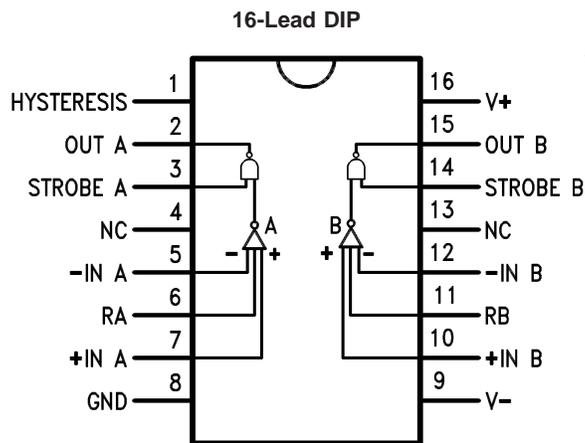
DS009761-1

Top View
Order Number DS9627MJ/883
See NS Package Number J16A
For Complete Military 883 Specifications, see RETS Data Sheet.

Absolute Maximum Ratings (Note 1)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/ Distributors for availability and specifications.

Storage Temperature Range	−65°C to +175°C
Operating Temperature Range	−55°C to +125°C
Lead Temperature (Soldering, 60 sec.)	300°C
Internal Power Dissipation (Note 5)	400 mW
V^+ to GND	0V to +15V
V^- to GND	0V to −15V
Input Voltage Referred to GND	±25V
Strobe to GND	−0.5V to +5.5V
Applied Output Voltage	−0.5V to +15V

Operating Conditions

	Min	Max	Units
Supply Voltage (V_{CC})	4.5	5.5	V
Temperature (T_A)	−55	+125	°C

Electrical Characteristics (Notes 2, 3)
Hysteresis, −IN A, −IN B, RA and RB Open for MIL-STD-188C, unless otherwise specified

Symbol	Characteristics	Conditions		Min	Max	Units
V_{OL}	Output Voltage LOW	V^+ = 10.8V, V^- = −13.2V, V_I^+ = 0.6V, I_{OL} = 6.4 mA			0.4	V
V_{OH}	Output Voltage HIGH	V^+ = 10.8V, V^- = −13.2V, V_I^+ = 0.6V, I_{OH} = −0.5 mA		2.4		V
I_{OS}	Output Short Circuit Current (Note 4)	V+ = 13.2V, V^- = −10.8V, V_{I+} = 0.6V, V_O = 0V		−3.0		mA
I_{IH}(ST)	Input Current HIGH (Strobe)	V^+ = 10.8V, V^- = −13.2V, V_I^+ = 0.6V	V_{ST} = 2.4V		40	µA
			V_{ST} = 5.5V		1.0	mA
R_I	Input Resistance	V^+ = 13.2V, V^- = −13.2V, −3.0V ≤ V_I^+ ≤ 3.0V		6.0		kΩ
I_{TH+}	Positive Threshold Current	±10.8V ≤ V_{CC} ≤ ±13.2V, V_O = 2.4V			100	µA
I_{TH}^-	Negative Threshold Current	±10.8V ≤ V_{CC} ≤ ±13.2V, V_O = 0.4V		−100		µA
V_{IL}(ST)	Input Voltage LOW (Strobe)	V_I^+ = −0.6V			0.8	V
V_{IH}(ST)	Input Voltage HIGH (Strobe)	V^+ = 13.2V, V^- = −10.8V, V_I^+ = −0.6V		2.0		V
I^+	Positive Supply Current	±10.8V ≤ V_{CC} ≤ ±13.2V V_I^+ = −0.6V			18	mA
I^-	Negative Supply Current	±10.8V ≤ V_{CC} ≤ ±13.2V V_I^+ = 0.6V		−16		mA

Electrical Characteristics
+IN A and −IN B connected to ground, RA and RB connected to −IN A and −IN B and Hysteresis connected to V^- for RS-232C, unless otherwise specified

Symbol	Characteristics	Conditions	Min	Max	Units
R_I	Input Resistance	3.0V ≤ V_I ≤ 25V	3.0	7.0	kΩ
		−3.0V ≤ V_I ≤ −25V	3.0	7.0	kΩ
V_I	Input Voltage		−2.0	2.0	V
V_{TH+}	Positive Threshold Voltage			3.0	V
$V_{TH−}$	Negative Threshold Voltage		−3.0		V

Note 1: "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the devices should be operated at these limits. The tables of "Electrical Characteristics" provide conditions for actual device operation.

Note 2: Unless otherwise specified Min/Max limits apply across the −55°C to +125°C temperature range.

Note 3: All currents into device pins are positive; all currents out of device pins are negative. All voltages are referenced to ground unless otherwise specified.

**Note 4:** Only one output at a time should be shorted.

Note 5: Rating applies to ambient temperatures up to +125°C. Above 125°C ambient, derate linearity at 120°C/W.

Electrical Characteristics

$V_{CC} = \pm 12V$ for MIL-STD-188C and RS-232C, $T_A = 25°C$

Symbol	Characteristics	Conditions	Min	Max	Units
t_{PLH}	Propagation Delay to High Level	See *Figure 1*		250	ns
t_{PHL}	Propagation Delay to Low Level	See *Figure 1*		250	ns
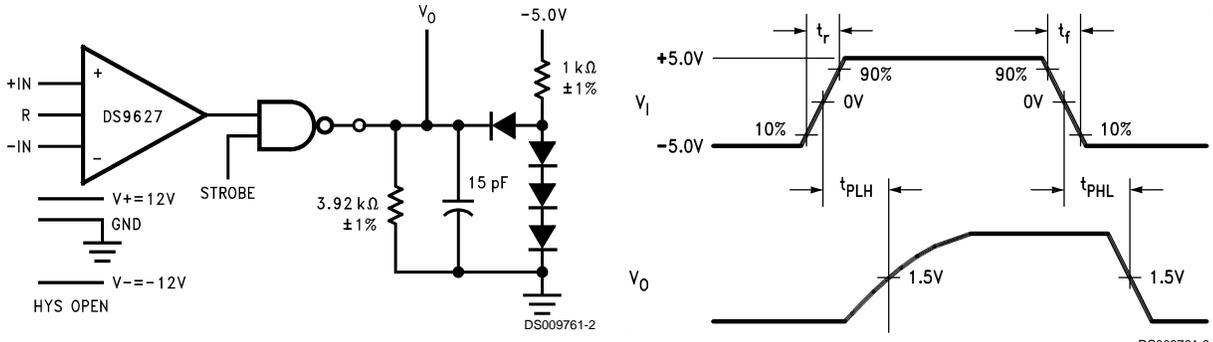
15 pF includes jig capacitance. All diodes are FD777 or equivalent.

PRR = 10 kHz
PW = 50 µs
$t_r = t_f$ = 5 ns

FIGURE 1. Switching Time Test Circuit and Waveforms

Equivalent Circuit (½ of Circuit)
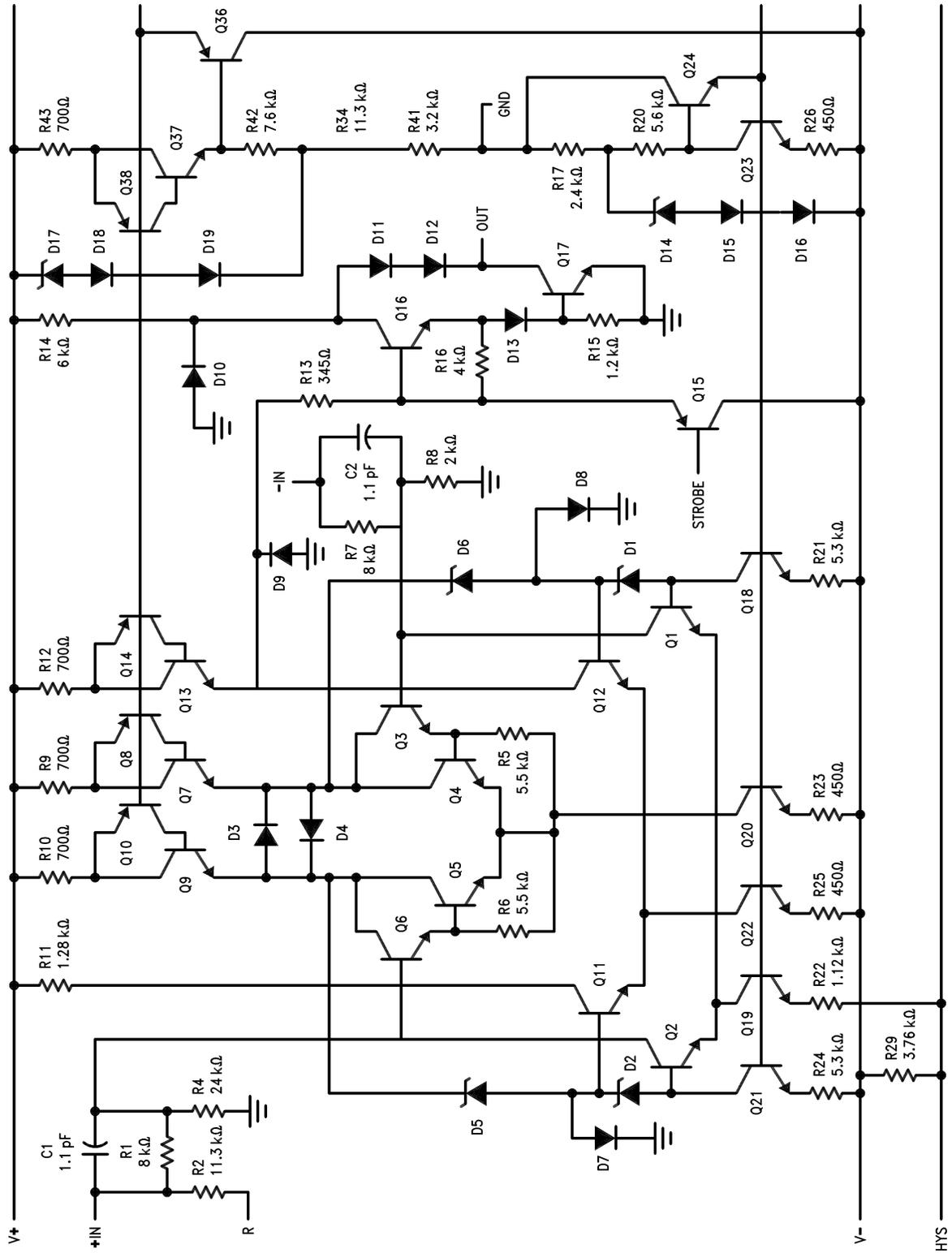
DS009761-4

Physical Dimensions inches (millimeters) unless otherwise noted
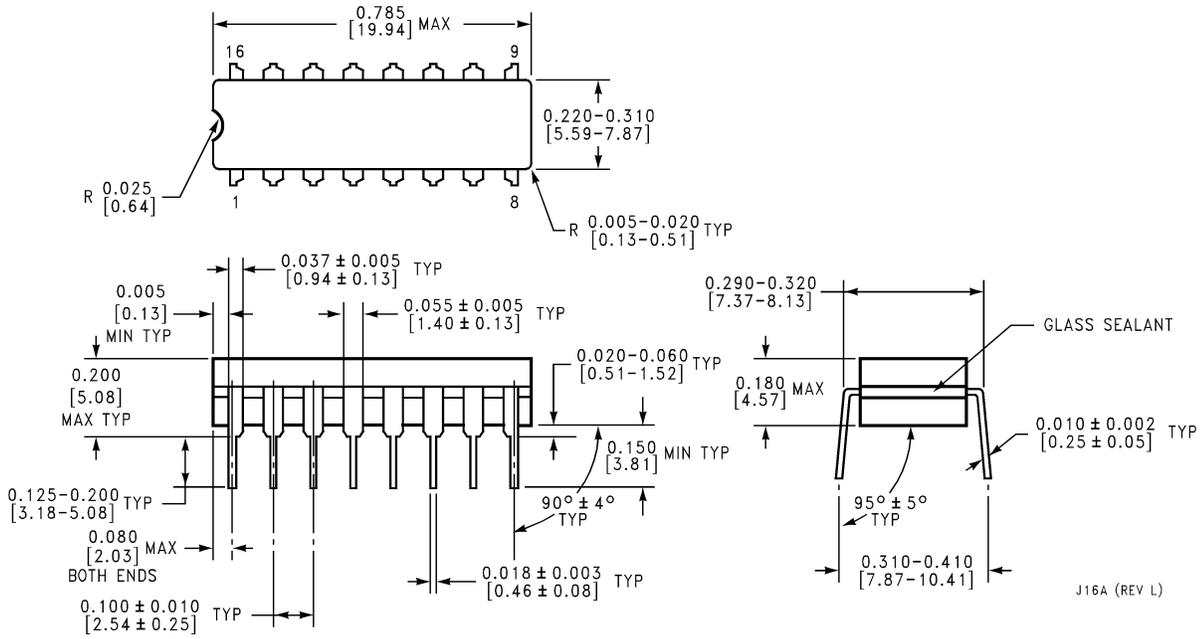
Ceramic Dual-In-Line Package
Order Number DS9627MJ/883
NS Package Number J16A

J16A (REV L)

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