

9621

DUAL-LINE DRIVER

FAIRCHILD INTEGRATED CIRCUIT

GENERAL DESCRIPTION — The 9621 was designed to drive transmission lines in either a differential or a single-ended mode. Output clamp diodes and back-matching resistors for 130Ω twisted pair are provided. The output has the capability of driving high capacitance loads. It can typically switch >200 mA during transients.

FEATURES

- CCSL COMPATIBILITY
- TRANSMISSION LINE BACK-MATCHING
- OUTPUT CLAMP DIODES
- HIGH CAPACITANCE DRIVE
- HIGH OUTPUT VOLTAGE
- MILITARY TEMPERATURE RANGE

ABSOLUTE MAXIMUM RATINGS (above which the useful life may be impaired)

Storage Temperature	−65°C to +150°C
Temperature (Ambient) Under Bias	−55°C to +125°C
V_{CC1} Pin Potential to Ground Pin	+3.8 V to +8 V
Input Voltage	−.5 V to +15 V
Voltage Applied to Outputs	−2 V to + $V_{CC1} + 1$ V
V_{CC2} Pin Potential to Ground Pin	V_{CC1} to +15 V

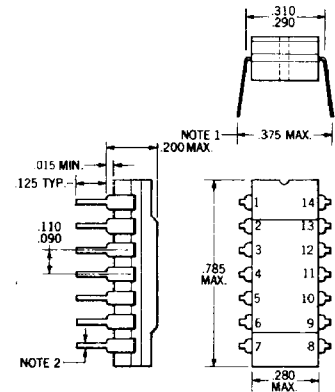
ORDER INFORMATION

Specify U6A9621XXX for 14 pin Dual In-Line Package or U319621XXX for 14 pin Flat Package where XXX is 51X for the −55°C to +125°C temperature range, or 59X for the 0°C to +75°C temperature range.

TYPICAL DUAL IN-LINE PACKAGE

Similar to

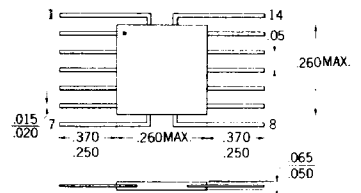
JEDEC (TO-116) Outline



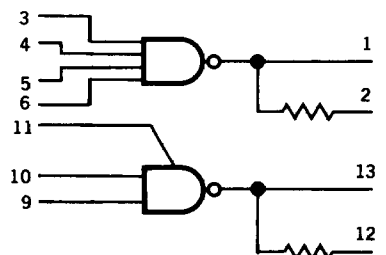
NOTES:

1. Leads are intended for insertion in hole rows on .300" centers. They are purposely shipped with "positive" (.375) misalignment to facilitate insertion.
2. Board-drilling dimensions should equal your practice for a conventional .020 inch diameter lead.

14 PIN FLAT PACKAGE



LOGIC DIAGRAM

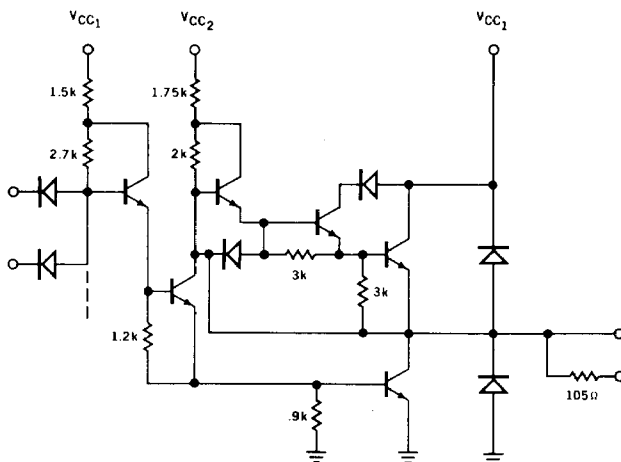


$V_{CC1}=14$

$V_{CC2}=8$

GND=7

SCHEMATIC DIAGRAM



FAIRCHILD
SEMICONDUCTOR
A DIVISION OF FAIRCHILD CAMERA AND INSTRUMENT CORPORATION

FAIRCHILD INTEGRATED CIRCUIT 9621

ELECTRICAL CHARACTERISTICS

MILITARY TEMPERATURE RANGE -55°C to $+125^{\circ}\text{C}$ (UXX962151X)

SYMBOL	NOTES	CHARACTERISTICS	LIMITS						UNITS	CONDITIONS & COMMENTS		
			−55°C		+25°C			+125°C				
			MIN.	MAX.	MIN.	TYP.	MAX.	MIN.				MAX.
V _{OL}		Output Low Voltage		350		200	350	400	mV	I _{OL} = 20 mA	V _{CC1} = 4.5 V V _{CC2} = 10.8 V	
V _{OH}		Output High Voltage	4.0		4.0	4.3		4.0	V	I _{OH} = −20 mA	V _{CC1} = 4.5 V V _{CC2} = 10.8 V	
I _{SC}	1	Output “Short Circuit” Current			−180	−300			mA	V _{OUT} = 0 V	V _{CC1} = 4.5 V V _{CC2} = 10.8 V	
I _{OL}	1	Output Low Current			150	200			mA	V _{OUT} = 5.0 V	V _{CC1} = 4.5 V V _{CC2} = 10.8 V	
I _F		Input Forward Current		1.8		1.15	1.8	1.8	mA	V _F = 0 V	V _{CC1} = 5.5 V V _{CC2} = 13.2 V	
I _R		Input Reverse Current		2.0		<1.0	2.0	5.0	μA	V _R = 5.5 V	V _{CC1} = 5.5 V V _{CC2} = 13.2 V	
V _{OLR}	2	Resistive Output Low Voltage				380	500		V	I _{OL} = 2.8 mA	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OHR}	2	Resistive Output High Voltage			4.0	4.2			V	I _{OH} = −2.3 mA	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OLC}	3	Clamped Output Low Voltage				−1.0	−2.0		V	I _{OL} = −20 mA	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OHC}	3	Clamped Output High Voltage				6.0	7.0		V	I _{OH} = 20 mA	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
I _{CC1}		+5 V Supply Current		7.0		4.7	7.0	7.3	mA	Inputs Open	V _{CC1} = 5.5 V V _{CC2} = 13.2 V	
I _{CC2}		+12 V Supply Current		9.8		6.5	9.8	9.8	mA			
t _{pd+}	4	Turn-Off Time				30	150		ns	C _L = 5000 pF	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
t _{pd−}	4	Turn-On Time				80	150		ns			
t _{pd+}		Turn-Off Time				13	25		ns	C _L = 30 pF	V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
t _{pd−}		Turn-On Time				9	25		ns			
V _{IL}		Input Low Voltage		1.3		1.5	1.0	0.7	V	V _{CC1} = 5.5 V V _{CC2} = 10.8 V		
V _{IH}		Input High Voltage	2.2		2.0	1.7		1.8	V	V _{CC1} = 4.5 V V _{CC2} = 13.2 V		

NOTES:

- (1) Pulse tests to insure transient current handling (test time = 3 seconds maximum — one side only).
- (2) Test output resistance including 105Ω output resistor.
- (3) Tests output clamp diodes.
- (4) With both sides loaded at $T_A = +125^{\circ}\text{C}$, maximum frequency = 500 kHz for Dual In-Line package ($\theta_{JA} = 95^{\circ}\text{C/W}$) or 300 kHz for Ceramic Flat Pak ($\theta_{JA} = 165^{\circ}\text{C/W}$).

FAIRCHILD INTEGRATED CIRCUIT 9621

ELECTRICAL CHARACTERISTICS

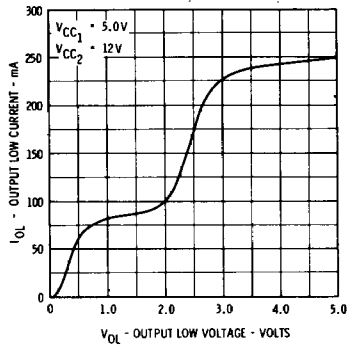
INDUSTRIAL TEMPERATURE RANGE 0°C to +75°C (UXX962159X)

SYMBOL	NOTES	CHARACTERISTICS	LIMITS						UNITS	CONDITIONS & COMMENTS		
			0°C		+25°C			+75°C				
			MIN.	MAX.	MIN.	TYP.	MAX.	MIN.				MAX.
V _{OL}		Output Low Voltage		400		200	400		450	mV	I _{OL} = 20 mA V _{CC1} = 4.75 V V _{CC2} = 11.4 V	
V _{OH}		Output High Voltage	4.2		4.2	4.4		4.2		V	I _{OH} = −20 mA V _{CC1} = 4.75 V V _{CC2} = 11.4 V	
I _{SC}	1	Output “Short Circuit” Current			−100	−300				mA	V _{OUT} = 0 V V _{CC1} = 4.75 V V _{CC2} = 11.4 V	
I _{OL}	1	Output Low Current			75	200				mA	V _{OUT} = 5.0 V V _{CC1} = 4.75 V V _{CC2} = 11.4 V	
I _F		Input Forward Current		1.8		1.15	1.8		1.8	mA	V _F = 0 V V _{CC1} = 5.25 V V _{CC2} = 12.6 V	
I _R		Input Reverse Current		5.0		<1.0	5.0		10.0	μA	V _R = 5.5 V V _{CC1} = 5.25 V V _{CC2} = 12.6 V	
V _{OLR}	2	Resistive Output Low Voltage				380	500			V	I _{OL} = 2.8 mA V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OHR}	2	Resistive Output High Voltage			4.0	4.2				V	I _{OH} = −2.3 mA V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OLC}	3	Clamped Output Low Voltage				−1.0	−2.0			V	I _{OL} = −20 mA V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
V _{OHC}	3	Clamped Output High Voltage				6.0	7.0			V	I _{OH} = 20 mA V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
I _{CC1}		+5 V Supply Current		7.0		4.7	7.0		7.3	mA	Inputs Open V _{CC1} = 5.25 V V _{CC2} = 12.6 V	
I _{CC2}		+12 V Supply Current		9.8		6.5	9.8		9.8	mA		
t _{pd+}	4	Turn-Off Time				30	200			ns	C _L = 5000 pF V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
t _{pd−}	4	Turn-On Time				80	200			ns		
t _{pd+}		Turn-Off Time				13	40			ns	C _L = 30 pF V _{CC1} = 5.0 V V _{CC2} = 12.0 V	
t _{pd−}		Turn-On Time				9	40			ns		
V _{IL}		Input Low Voltage		1.3		1.5	1.0		0.7	V	V _{CC1} = 5.25 V V _{CC2} = 12.6 V	
V _{IH}		Input High Voltage	2.2		2.0	1.7		1.8		V	V _{CC1} = 4.75 V V _{CC2} = 11.4 V	

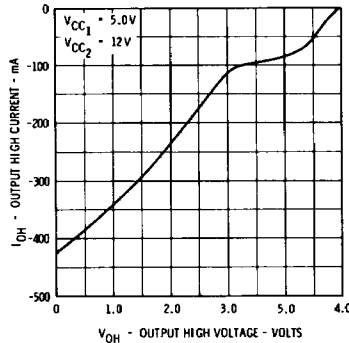
NOTES:

- (1) Pulse tests to insure transient current handling (test time = 3 seconds maximum — one side only).
- (2) Test output resistance including 105Ω output resistor.
- (3) Tests output clamp diodes.
- (4) Maximum frequency = 500 kHz with both sides loaded at $T_A = +75^\circ\text{C}$ for both Dual In-Line package and Ceramic Flat Pak.

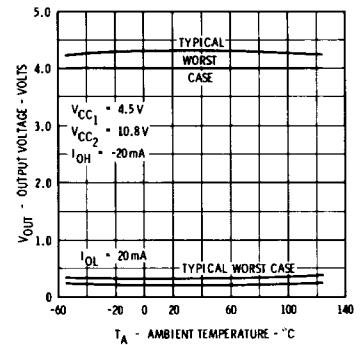
TYPICAL OUTPUT LOW CURRENT VERSUS OUTPUT LOW VOLTAGE



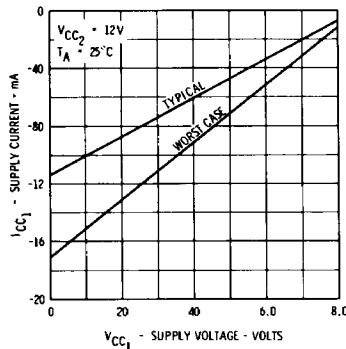
TYPICAL OUTPUT HIGH CURRENT VERSUS OUTPUT HIGH VOLTAGE



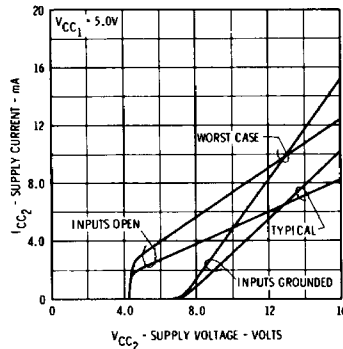
LOGIC LEVELS VERSUS AMBIENT TEMPERATURE



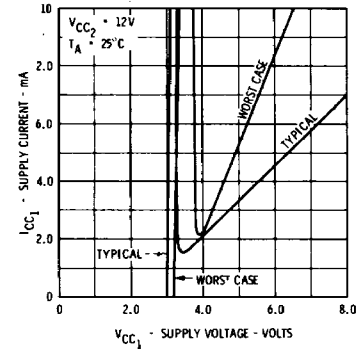
SUPPLY CURRENT VERSUS SUPPLY VOLTAGE INPUTS GROUND



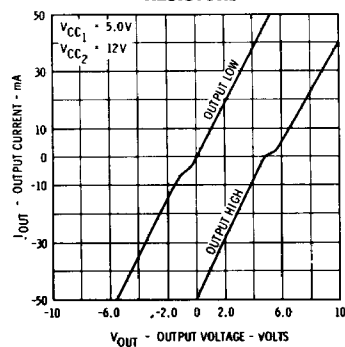
SUPPLY CURRENT VERSUS SUPPLY VOLTAGE INPUTS OPEN



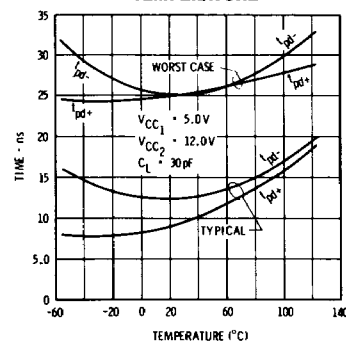
SUPPLY CURRENT VERSUS SUPPLY VOLTAGE



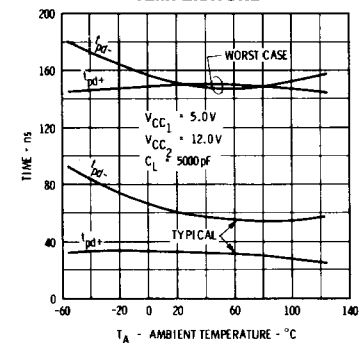
TYPICAL OUTPUT IMPEDANCE WITH BACK MATCHING RESISTORS



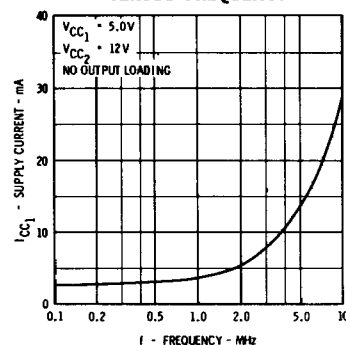
SWITCHING TIME VERSUS TEMPERATURE



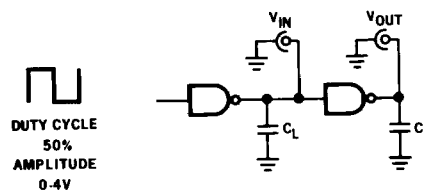
SWITCHING TIME VERSUS TEMPERATURE



TYPICAL SUPPLY CURRENT VERSUS FREQUENCY



SWITCHING TIME TEST CIRCUIT



WAVEFORMS

