

9612 • 9612A • 9612E

DUAL DIFFERENTIAL LINE DRIVERS

FAIRCHILD LINEAR INTEGRATED CIRCUITS

GENERAL DESCRIPTION — The 9612 Dual Differential Line Driver is designed specifically to drive single ended or differential, back matched or terminated transmission lines. The outputs are similar to totem pole TTL outputs, with active pull-up and pull-down, for use in simplex or simplex distribution bus systems. The devices feature a short circuit protected active pull-up. The inputs and outputs have clamp diodes to minimize the effect of line transients. The active pull-up output offers low output impedance allowing back matching or parallel termination of the line. The 9612E and 9612A are specified to drive 50 Ω transmission line at high speed while guaranteeing a maximum skew between outputs of less than 3.5 ns for application requiring high performance line drivers. (9613 is the functional complement).

9612/9612A/9612E

- SINGLE 5 V SUPPLY
- TTL COMPATIBLE INPUTS
- OUTPUT SHORT CIRCUIT PROTECTION
- INPUT CLAMP DIODES
- OUTPUT CLAMP DIODES FOR TERMINATION OF LINE TRANSIENTS
- COMPLEMENTARY OUTPUTS

9612A/9612E

- GUARANTEED MAXIMUM OUTPUT SKEW
- HIGH OUTPUT DRIVE CAPABILITY FOR 50 Ω TRANSMISSION LINES

ABSOLUTE MAXIMUM RATINGS

Storage Temperature	-65°C to +150°C
Operating Temperature	
9612A	-55°C to +125°C
9612, 9612E	0°C to +70°C
V _{CC}	+7.0 V
V _{IN}	-0.5 V to +5.5 V
Internal Power Dissipation (Note 1)	800 mW
Pin Temperature (Soldering, 10 s)	
Hermetic Mini DIP (Soldering, 60 s)	300°C
Molded Mini DIP (Soldering, 10 s)	260°C

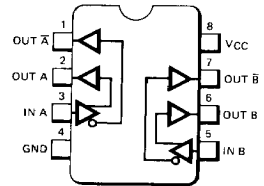
NOTE:

1. For the Hermetic Mini DIP and Molded Mini DIP derate above 30°C at 6.7 mW/°C.

CONNECTION DIAGRAM 8-PIN MINIDIP

(TOP VIEW)

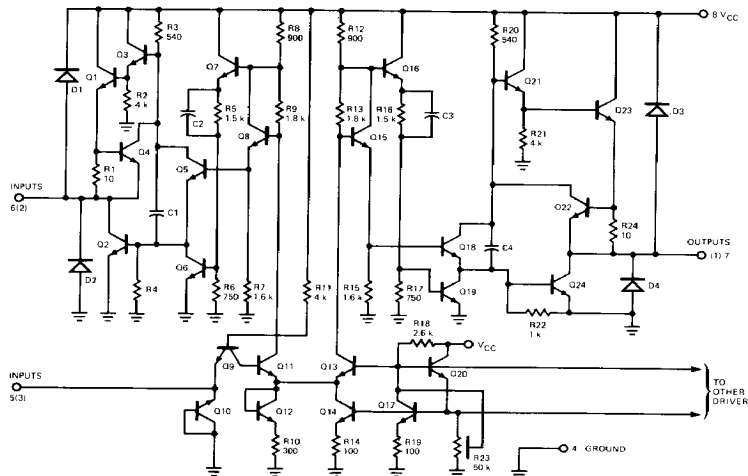
PACKAGE OUTLINE 9T 6T
PACKAGE CODE T R



ORDER INFORMATION

TYPE	PART NO.
9612	9612TC
9612E	9612ETC
9612A	9612ARM
9612	9612RC
9612E	9612ERC

EQUIVALENT CIRCUIT (1/2 of 9612)



ELECTRICAL CHARACTERISTICS: $V_{CC} = 5.0 \text{ V} \pm 10\%$, $T_A = -55^\circ\text{C}$ to $+125^\circ\text{C}$, unless otherwise specified

SYMBOL	CHARACTERISTICS	CONDITIONS	LIMITS			UNITS
			MIN	TYP	MAX	
V_{OL}	Output LOW Voltage	$I_{OL} = 40 \text{ mA}$		200	400	mV
V_{OLC}	Clamped Output LOW Voltage	$I_{OLC} = -40 \text{ mA}$	-1.5	-0.8		V
V_{OH}	Output HIGH Voltage	$I_{OH} = -40 \text{ mA}$	2.0	2.75		V
I_{SC}	Output Short Circuit Current	$V_{OUT} = 0 \text{ V}$	-140	-77	-42	mA
V_{IL}	Input LOW Voltage				0.8	V
V_{IH}	Input HIGH Voltage		2.0			V
I_{IL}	Input LOW Current	$V_{IL} = 0.4 \text{ V}$	-1.6			mA
I_{IH}	Input HIGH Current	$V_{IH} = 2.4 \text{ V}$			40	μA
I_R	Input Reverse Current	$V_R = 4.5 \text{ V}$			1.0	mA
V_{CD}	Input Clamp Diode Voltage	$V_{CC} = 4.75 \text{ V}$, $I_{IC} = -12 \text{ mA}$, $T = 25^\circ\text{C}$	-1.5	-0.8		V
I_{CC}	Supply Current	Inputs = 0 V, $T = 25^\circ\text{C}$		42	50	mA
I_{max}	Max. Supply Current	Inputs = 0 V, $V_{max} = 7.0 \text{ V}$, $T = 25^\circ\text{C}$		59	70	mA

ELECTRICAL CHARACTERISTICS: $V_{CC} = 5.0 \text{ V} \pm 5\%$, $T_A = 0^\circ\text{C}$ to 70°C , unless otherwise specified

SYMBOL	CHARACTERISTICS	CONDITIONS	LIMITS						UNITS
			9612			9612E			
			MIN	TYP	MAX	MIN	TYP	MAX	
V _{OL}	Output LOW Voltage	I _{OL} = 40 mA I _{OL} = 50 mA (9612E only)		200	400		200 250	400 400	mV mV
V _{OLC}	Clamped Output LOW Voltage	I _{OLC} = -40 mA I _{OLC} = -50 mA (9612E only)	-1.5	-0.8		-1.5 -1.5	-0.8 -0.9		V V
V _{OH}	Output HIGH Voltage	I _{OH} = -40 mA I _{OH} = -50 mA (9612E only)	2.4	2.75		2.4 2.4	2.75 2.60		V V
I _{SC}	Output Short Circuit Current	V _{OUT} = 0V	-140	-77	-42	-140	-77	-55	mA
V _{IL}	Input LOW Voltage				0.8			0.8	V
V _{IH}	Input HIGH Voltage		2.0			2.0			V
I _{IL}	Input LOW Current	V _{IL} = 0.4 V	-1.6			-1.6			mA
I _{IH}	Input HIGH Current	V _{IH} = 2.4 V			40			40	μA
I _R	Input Reverse Current	V _R = 4.5 V			1.0			1.0	mA
V _{CD}	Input Clamp Diode Voltage	V _{CC} = 4.75 V, I _{IC} = -12 mA	-1.5	-0.8		-1.5	-0.8		V
I _{CC}	Supply Current	Inputs = 0 V		42	50		42	50	mA
I _{max}	Max. Supply Current	Inputs = 0 V, V _{max} = 7.0 V		59	70		59	70	mA

AC CHARACTERISTICS: $T_A = 25^\circ\text{C}$, $V_{CC} = 5.0 \text{ V}$, $R_L = 100 \Omega$ (Note 1)

SYMBOL	CHARACTERISTICS	CONDITIONS	LIMITS						UNITS
			9612			9612A/9612E			
			MIN	TYP	MAX	MIN	TYP	MAX	
t _{PLH}	Turn Off Time	R _L = 100 Ω (Note 1) C _L ≤ 15 pF See Fig. 1			30			20	ns
t _{PHL}	Turn On Time				30			20	ns
t _s	Output Skew					−3.5		+3.5	ns

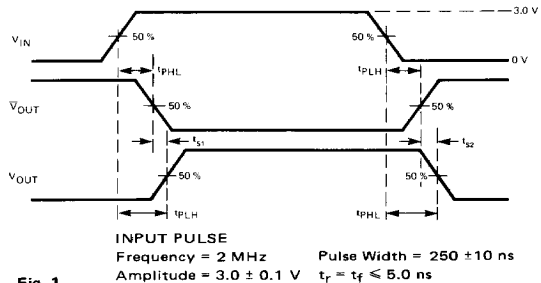
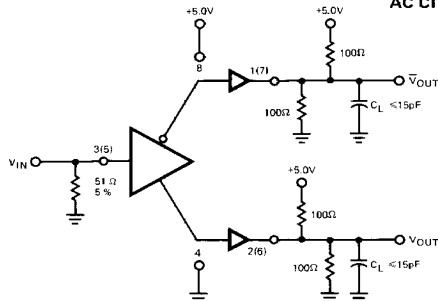
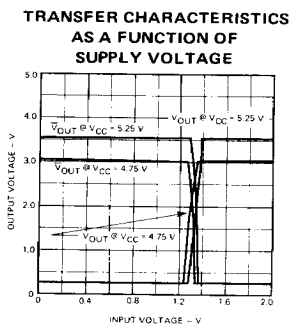
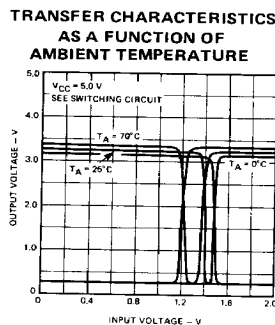
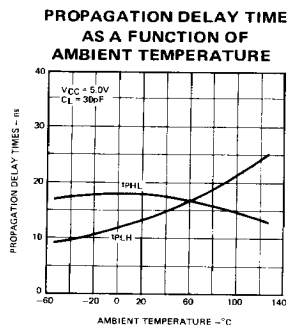
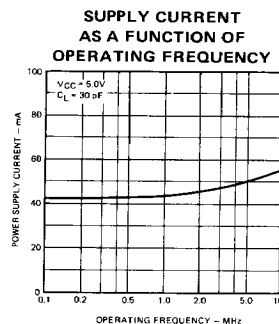
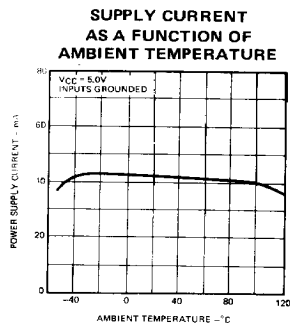
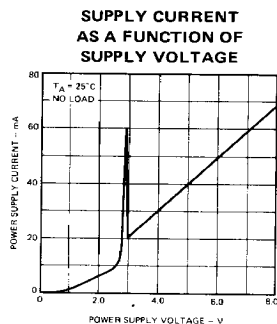
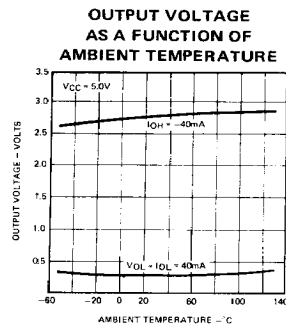
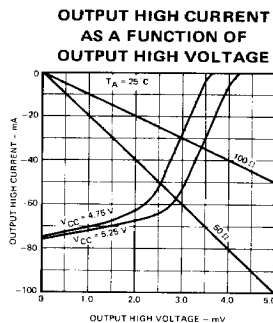
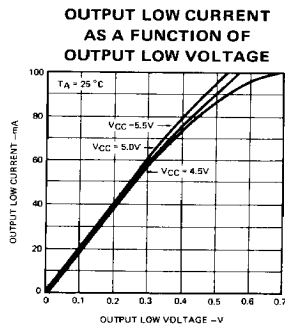
NOTE: 1. R_L must be noninductive.**AC CIRCUIT AND WAVEFORMS**

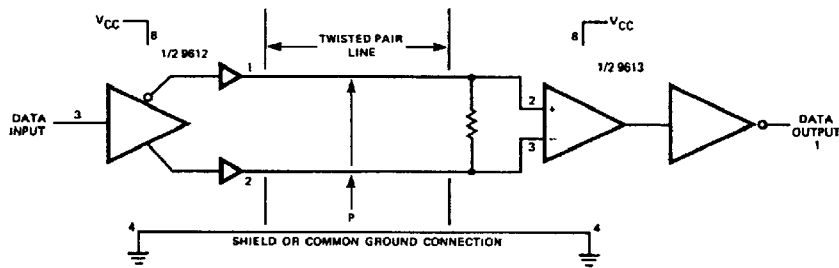
Fig. 1

TYPICAL PERFORMANCE CURVES



TYPICAL APPLICATIONS

SIMPLEX BALANCED DIFFERENTIAL OPERATION



TYPICAL REFLECTION DIAGRAM

