FAIRCHILD
A Schlumberger Company

μA9640(26S10) Quad General Purpose Bus Transceiver

Linear Division Interface Products

Description

The μA9640(26S10) is a high speed quad bus transceiver. Each driver output, which is capable of sinking 100 mA at 0.8 V, is connected internally to the high speed bus receiver in addition to being connected to the package lead. The receiver has a Schottky TTL output capable of driving ten Schottky TTL unit loads. The bus output is capable of driving lines having 100 Ω impedance.

The line can be terminated at both ends and still give considerable noise margin at the receiver. The typical switching point of the receiver is 2.0 V.

The μA9640(26S10) features advanced Schottky processing to minimize propagation delay. The device package also has two ground leads to improve ground current handling and allow close decoupling between V_{CC} and ground at the package. Both GND_1 and GND_2 should be tied to the ground bus external to the device package.

The μA9640(26S10) is a lead for lead replacement for the AM26S10.

- **Input To Bus Is Inverting**
- **Quad High Speed Open Collector Bus Transceivers**
- **Driver Outputs Can Sink 100 mA At 0.8 V Maximum**
- **Advanced Schottky Processing**
- **PNP Input To Reduce Input Loading**

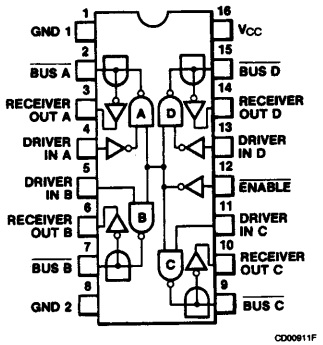
Absolute Maximum Ratings

Storage Temperature Range	
Ceramic DIP	−65°C to +175°C
Molded DIP	−65°C to +150°C
Operating Temperature Range	
Extended (μA9640M)	−55°C to +125°C
Commercial (μA9640C)	0°C to +70°C
Lead Temperature	
Ceramic DIP (soldering, 60 s)	300°C
Molded DIP (soldering, 10 s)	265°C
Internal Power Dissipation[1,2]	
16L-Ceramic DIP	1.50 W
16L-Molded DIP	1.04 W
V_{CC} Lead Potential to Ground	−0.5 V to +7.0 V
Voltage Applied to Outputs	
for HIGH Output State	−0.5 V to V_{CC} Max
Input Voltage	−0.5 V to +5.5 V
Output Current, into Bus	200 mA
Output, into Outputs (except Bus)	30 mA
Input Current	−30 mA to +5.0 mA

Notes

1. $T_{J\ Max}$ = 175°C for the Ceramic DIP, and 150°C for the Molded DIP.
2. Ratings apply to ambient temperature at 25°C. Above this temperature, derate the 16L-Ceramic DIP at 10 mW/°C, and the 16L-Molded DIP at 8.3 mW/°C.

Connection Diagram 16-Lead DIP (Top View)



Order Information

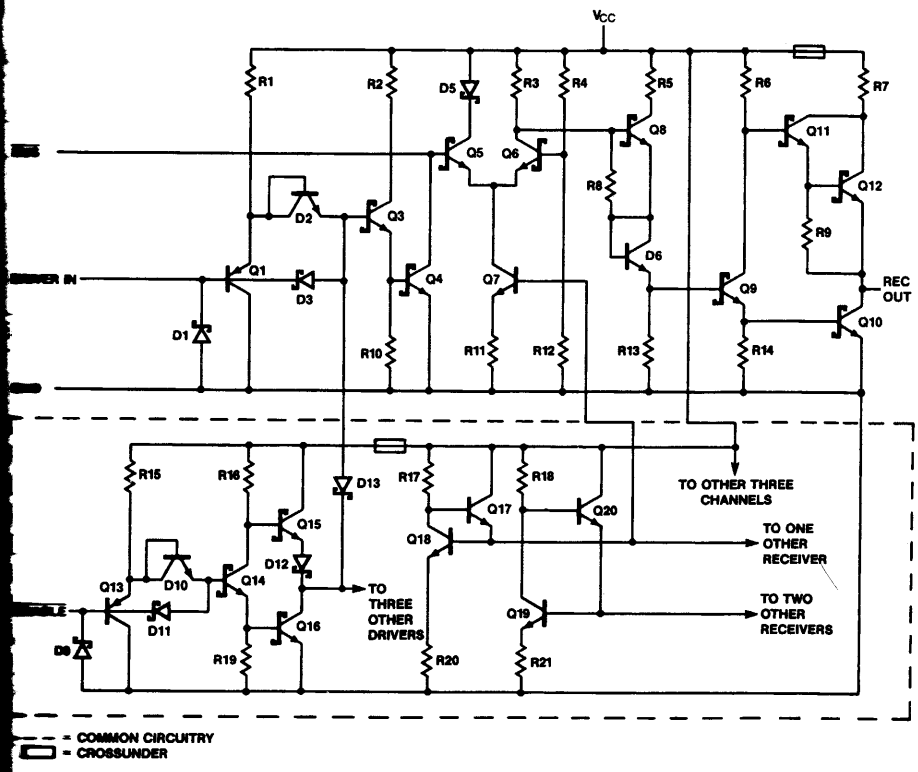
Device Code	Package Code	Package Description
μA9640DM(26S10)	6B	Ceramic DIP
μA9640DC(26S10)	6B	Ceramic DIP
μA9640PC(26S10)	9B	Molded DIP

Truth Table

Inputs		Outputs	
$\overline{\text{ENABLE}}$	Driver IN_{A-D}	$\overline{BUS}_{A-D}$	Receiver Out_{A-D}
L	L	H	L
L	H	L	H
H	X	Y	$\overline{Y}$

H = HIGH Voltage Level
L = LOW Voltage Level
X = Don't Care
Y = Voltage Level of Bus (Assumes control by another bus transceiver.)

uivalent Circuit (1/4 of Circuit – Except Strobe)



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Recommended Operating Conditions

Symbol	Characteristic	Extended[4]			Commercial[5]			Unit
		Min	Typ	Max	Min	Typ	Max	
V_{CC}	Supply Voltage	4.50	5.0	5.5	4.75	5.0	5.25	V
T_A	Operating Temperature	−55	25	125	0	25	70	°C

μA9640(26S10)
Electrical Characteristics Over recommended operating temperature and supply voltage ranges, unless otherwise specified.

DC Characteristics

Symbol	Characteristic	Condition[1]		Min	Typ[2]	Max	Unit
V_{OH}	Output Voltage HIGH (Receiver Outputs)	V_{CC} = Min, I_{OH} = −1.0 mA, $V_I = V_{IL}$ or V_{IH}	Extended[4]	2.5	3.4		V
			Comm[5]	2.7	3.4		
V_{OL}	Output Voltage LOW (Receiver Outputs)	V_{CC} = Min, I_{OL} = 20 mA, $V_I = V_{IL}$ or V_{IH}				0.5	V
V_{IH}	Input Voltage HIGH (Except Bus)	Guaranteed Input Logic HIGH for All Inputs		2.0			V
V_{IL}	Input Voltage LOW (Except Bus)	Guaranteed Input Logic LOW for All Inputs				0.8	V
V_{IC}	Input Clamp Voltage (Except Bus)	V_{CC} = Min, I_I = −18 mA				−1.2	V
I_{IL}	Input Current LOW	V_{CC} = Max, V_I = 0.4 V	ENABLE			−0.36	mA
			DATA			−0.54	
I_{IH}	Input Current HIGH	V_{CC} = Max, V_I = 2.7 V	ENABLE			20	μA
			DATA			30	
		V_{CC} = Max, V_I = 5.5 V				100	
I_{OS}	Output Short Circuit Current (Except Bus)[3]	V_{CC} = Max	Extended[4]	−20		−55	mA
			Comm[5]	−18		−60	
I_{CC}	Supply Current	V_{CC} = Max, $V_I = V_{IH}$, Enable = GND			45	70	mA

AC Characteristics V_{CC} = 5.0 V, T_A = 25°C

Symbol	Characteristic	Condition[6]	Min	Typ[2]	Max	Unit
t_{PD}	Data Input to Bus	R_B = 50 Ω, C_B = 50 pF		10	15	ns
	Enable Input to Bus			14	18	
	Bus to Receiver Out	R_B = 50 Ω, R_L = 280 Ω, C_B = 50 pF, C_L = 15 pF		10	15	
t_r	Rise Time Bus	R_B = 50 Ω, C_B = 50 pF	4.0	10		ns
t_f	Fall Time Bus		2.0	4.0		ns

μA9640(26S10) (Cont.)

Electrical Characteristics Over recommended operating temperature and supply voltage ranges, unless otherwise specified.

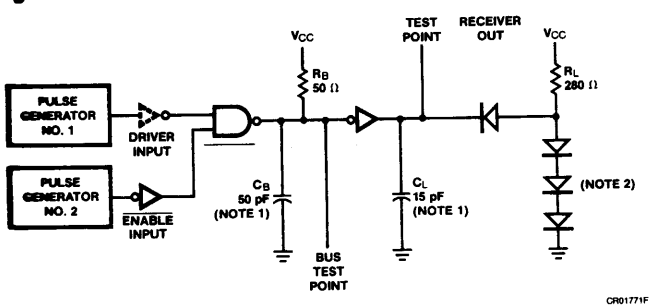
Bus Input/Output Characteristics

Symbol	Characteristic	Condition[1]			Min	Typ[2]	Max	Unit
V_{OL}	Output Voltage LOW	V_{CC} = Min	Extended[4]	I_{OL} = 40 mA		0.33	0.5	V
				I_{OL} = 70 mA		0.42	0.7	
				I_{OL} = 100 mA		0.51	0.8	
			Comm[5]	I_{OL} = 40 mA		0.33	0.5	
				I_{OL} = 70 mA		0.42	0.7	
				I_{OL} = 100 mA		0.51	0.8	
I_{CEX} (ON)	Bus Leakage Current	V_{CC} = Max		V_O = 0.8 V			−50	μA
			Extended[4]	V_O = 4.5 V			200	
			Comm[5]	V_O = 4.5 V			100	
I_{CEX} (OFF)	Bus Leakage Current	V_O = 4.5 V, V_{CC} = 0 V					100	μA
V_{TH}+	Receiver Input Threshold HIGH	Bus Enable = 2.4 V, V_{CC} = Max		Extended[4]		2.0	2.4	V
				Comm[5]		2.0	2.25	
V_{TH}−	Receiver Input Threshold LOW	Bus Enable = 2.4 V, V_{CC} = Min		Extended[4]	1.6	2.0		V
				Comm[5]	1.75	2.0		

Notes

1. For conditions shown as Min or Max, use the appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical limits are at V_{CC} = 5.0 V, T_A = 25°C ambient and maximum loading.
3. Not more than one output should be shorted at a time. Duration of the short circuit test should not exceed one second.
4. Extended temperature range, ceramic DIP.
5. Commercial temperature range, ceramic or molded DIP.
6. C_B and C_L include probe and jig capacitance.

Figure 1 AC Test Circuit



Notes

1. Includes probe and jig capacitance.
2. All Diodes 1N916 or equivalent.