



1:10 Clock Fanout Buffer

ComL™ SERIES

Product Features

- Low Voltage Operation
VDD range from 2.5 to 3.3V
- 1:10 Fanout
- Drives either a 50 ohm or 75 ohm load
- Low input capacitance
- Low output skew
- Low propagation delay
Typical (tpd) < 4ns
- High Speed Operation > 500MHz
- Industrial Operation at 0°C to +85°C
- Packages available include: SOIC/SSOP

Product Description

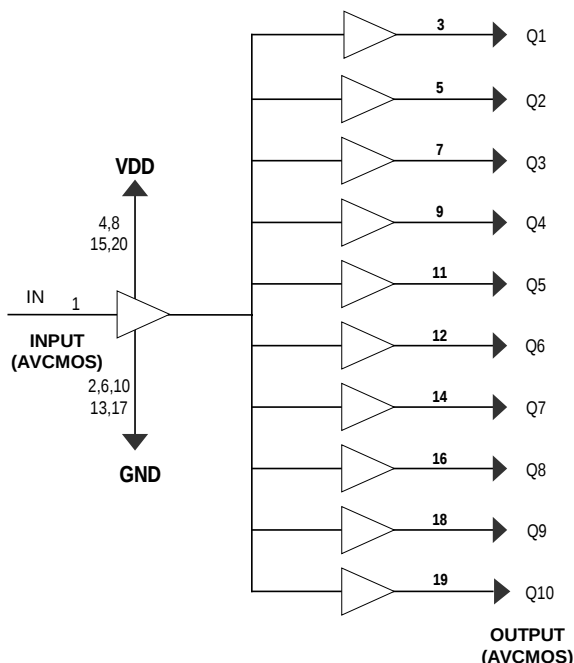
The CYPRESS series of network circuits are produced using advanced 0.35 micron CMOS technology, achieving the industries fastest logic and buffers.

The CYPRESS CY2CC810 fanout buffer features one input and ten outputs.

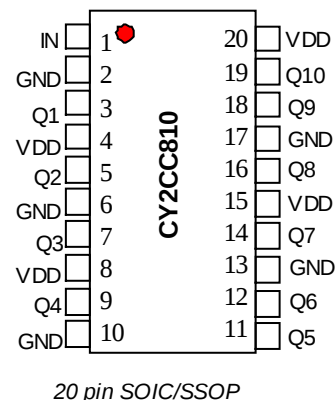
Designed for Data Communications clock management applications, the large fanout from a single input reduces loading on the input clock.

AVCMOS type outputs dynamically adjust for variable impedance matching and eliminate the need for series damping resistors and reduce noise overall.

Block Diagram



Pin Configuration





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CY2CC810

1:10 Clock Fanout Buffer

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Pin Description

Pin Number	Pin Name	Description
1	IN	Input
2,6,10,13,17	GND	Ground
4,8,15,20	V _{DD}	Power Supply
3,5,7,9,11,12,14,16,18,19	Q1,Q2,Q3,Q4,Q5,Q6,Q7,Q8,Q9,Q10	Output

Absolute Maximum Ratings:

Storage Temperature	-65°C to 150°C
Ambient Temperature	0°C to +85°C
Supply Voltage to Ground Potential (Inputs and V _{CC} only)	-0.5V to 4.6V
Supply Voltage to Ground Potential (outputs only)	-0.5V to V _{DD} +0.5V
DC Input Voltage	-0.5V to V _{DD} +0.5V
DC Output Voltage	-0.5V to V _{DD} +0.5V
Power Dissipation	0.75W

Note: Stresses greater than those listed under absolute maximum ratings may cause permanent damage to the device. This is intended to be a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.



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CY2CC810

1:10 Clock Fanout Buffer

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D.C. Electrical Characteristics: @ 3.3V

D.C. Electrical Characteristics (Over the Operating Range , TA =0 °C to +85, VDD=3.3V +/-10%							
Parameter	Description	Test Conditions		Min	Typ	Max	Units
V _{OH}	Output High Voltage	V _{DD} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OH} = -12mA	2.3	3.3		V
V _{OL}	Output Low Voltage	V _{DD} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OL} = 12mA		0.2	0.5	V
V _{IH}	Input High Voltage	Guaranteed Logic High Level		2			V
V _{IL}	Input Low Voltage	Guaranteed Logic Low Level				0.8	V
I _{IH}	Input High Current	V _{DD} =Max	V _{IN} =2.7V			1	uA
I _{IL}	Input Low Current	V _{DD} =Max	V _{IN} =0.5V			-1	uA
I _I	Input High Current	V _{DD} =Max., V _{IN} =V _{DD} (Max)				20	uA
V _{IK}	Clamp Diode Voltage	V _{DD} =Min., I _{IN} = -18mA			-0.7	-1.2	V
I _{OK}	Continuous Clamp Current	V _{DD} =Max, V _{OUT} = GND				-50	mA
O _{OFF}	Power Down Disable	V _{DD} = GND, V _{OUT} =<4.5V				100	uA
V _H	Input Hysteresis				80		mV

D.C. Electrical Characteristics: @ 2.5V

D.C. Electrical Characteristics (Over the Operating Range , TA =0 °C to +85 °C VDD=2.5 +/-10%							
Parameter	Description	Test Conditions		Min.	Typ	Max	Units
V _{OH}	Output High Voltage	V _{DD} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OH} = -7mA	1.80			V
			I _{OH} = -15.2mA	1.60			V
V _{OL}	Output Low Voltage	V _{DD} =Min., V _{IN} =V _{IH} or V _{IL}	I _{OL} = 15.2mA			0.65	V
V _{IH}	Input High Voltage	Guaranteed Logic High Level		1.60			V
V _{IL}	Input Low Voltage	Guaranteed Logic Low Level				0.9	V
I _{IH}	Input High Current	V _{DD} =Max	V _{IN} =2.4V			1	uA
I _{IL}	Input Low Current	V _{DD} =Max	V _{IN} =0.5V			-1	uA
I _I	Input High Current	V _{DD} =Max., V _{IN} =V _{DD} (Max)				20	uA
V _{IK}	Clamp Diode Voltage	V _{DD} =Min., I _{IN} = -18mA			-0.7	-1.2	V
I _{OK}	Continuous Clamp Current	V _{DD} =Max, V _{OUT} = GND				-50	mA
O _{OFF}	Power Down Disable	V _{DD} = GND, V _{OUT} =<4.5V				100	uA
V _H	Input Hysteresis				80		mV



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CY2CC810

1:10 Clock Fanout Buffer

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Capacitance:

Parameter	Description	Test Conditions	Typ	Max	Units
Cin	Input Capacitance	Vin = 0V	2.5	-	pF
Cout	Output Capacitance	Vout = 0V	6.5	-	pF

Power Supply Characteristics:

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
ΔI_{CC}	Delta Quiescent Power Supply Current LVTTTL/LVCMOS	value = (VDD = Max) – (VDD = VDD- 0.6V) with Input High	-	3	50	uA
ICCD	Dynamic Power Supply Current	VDD = Max Input toggling 50% Duty Cycle, Outputs Open	-	2.2	2.5	mA/MHz
IC	Total Power Supply Current	VDD = Max Input toggling 50% Duty Cycle, Outputs Open fL=100MHZ	-	230	265	mA

High Frequency Parametrics :

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Fmax	Maximum frequency VDD = 3.3V	50% duty cycle tW(50-50) Standard Load Circuit.	-	-	160	MHz
		50% duty cycle tW(50-50) The "point to point load circuit"			650	
Fmax(20)	Maximum frequency VDD = 3.3 V	20% duty cycle tW(20-80) The "point to point load circuit" Vin = 3.0V / 0.0V Vout = 2.3V / 0.4V	-	-	250	MHz
	Maximum frequency VDD = 2.5 V	The "point to point load circuit" Vin = 2.4 / 0.0V Vout = 1.7V / 0.7V	-	-	200	MHz
tW	Minimum pulse VDD = 3.3 V	The "point to point load circuit" Vin = 3.0V / 0.0V F= 100MHz Vout = 2.0V / 0.8V	1	-	-	ns
	Minimum pulse VDD = 2.5 V	The "point to point load circuit" Vin = 2.4 / 0.0V F= 100MHz Vout = 1.7V / 0.7V	1			



1:10 Clock Fanout Buffer

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AC Switching Characteristics @ 3.3

AC Switching Characteristics Over Operating Range $V_{DD} = 3.3V \pm 5\%$, Temperature = $0^{\circ}C$ to $+85^{\circ}C$						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
tPLH	Propagation Delay – Low to High			3.8		nS
tPHL	Propagation Delay – High to Low			3.8		nS
tR	Output Rise Time			0.8		V/nS
tF	Output Fall Time			0.8		V/nS
tSK(0)	Output Skew: Skew between outputs of the same package (in phase)		-	-	0.2	nS
tSK(p)	Pulse Skew: Skew between opposite transitions of the same output (tPHL – tPLH)		-	-	0.2	nS
tSK(t)	Package Skew: Skew between outputs of different packages at the same power supply voltage, temperature and package type.		-	-	0.3	nS

AC Switching Characteristics @ 2.5

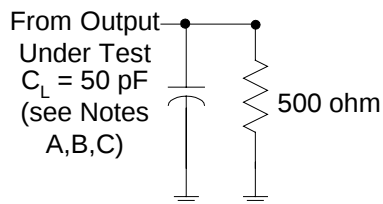
AC Switching Characteristics Over Operating Range $V_{DD} = 2.5V \pm 5\%$, Temperature = $0^{\circ}C$ to $+85^{\circ}C$						
Symbol	Parameter	Conditions	Min	Typ	Max	Units
tPLH	Propagation Delay – Low to High			3.8		nS
tPHL	Propagation Delay – High to Low			3.8		nS
tR	Output Rise Time			0.8		V/nS
tF	Output Fall Time			0.8		V/nS
tSK(0)	Output Skew: Skew between outputs of the same package (in phase)		-	-	0.2	nS
tSK(p)	Pulse Skew: Skew between opposite transitions of the same output (tPHL – tPLH)		-	-	0.2	nS
tSK(t)	Package Skew: Skew between outputs of different packages at the same power supply voltage, temperature and package type.		-	-	0.3	nS

1:10 Clock Fanout Buffer

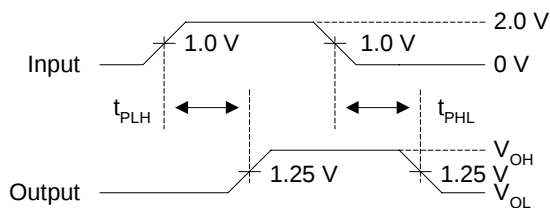
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Parameter Measurement Information

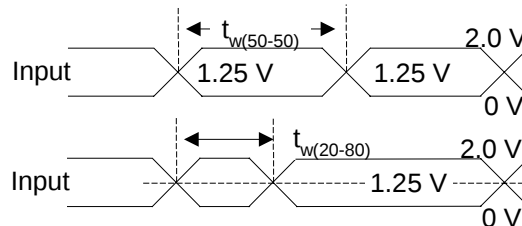
VDD @ 2.5



Load Circuit



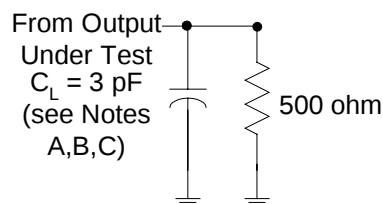
**Voltage Waveforms
Propagation Delay Times**



Voltage Waveforms - Pulse Duration

Notes:

- CL includes probe and jig capacitance.
- All input pulses are supplied by generators having the following characteristics: PRR < 10 MHz, $Z_0 = 50 \Omega$, $t_r < 2.5 \text{ nS}$, $t_f < 2.5 \text{ nS}$.
- The outputs are measured one at a time with one transition per measurement.
- t_{PLH} and t_{PHL} are the same as t_{pd} .



Point to Point Load Circuit



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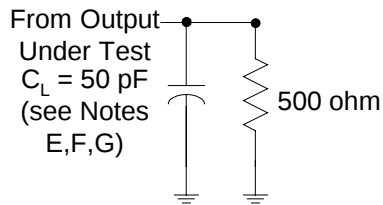
CY2CC810

1:10 Clock Fanout Buffer

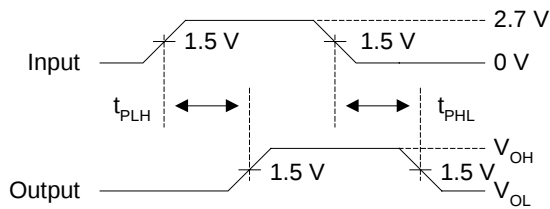
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Parameter Measurement Information

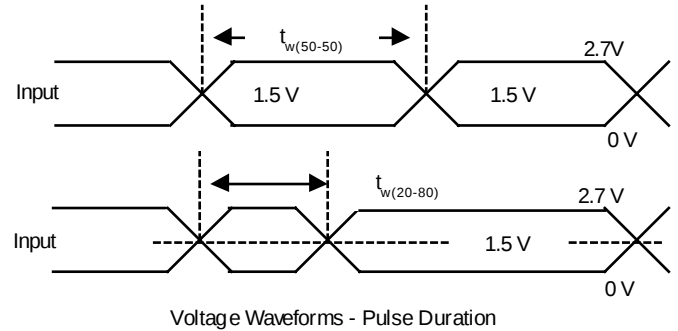
VDD @ 3.3



Load Circuit



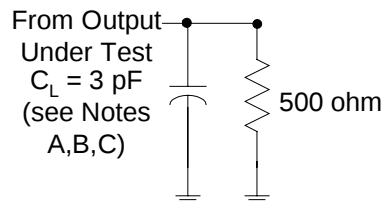
Voltage Waveforms
Propagation Delay Times



Voltage Waveforms - Pulse Duration

Notes:

- E. CL includes probe and jig capacitance.
- F. All input pulses are supplied by generators having the following characteristics: PRR < 100 MHz, $Z_O = 50 \Omega$, $t_r < 2.5 \text{ nS}$, $t_f < 2.5 \text{ nS}$.
- G. The outputs are measured one at a time with one transition per measurement.
- H. t_{PLH} and t_{PHL} are the same as t_{pd} .

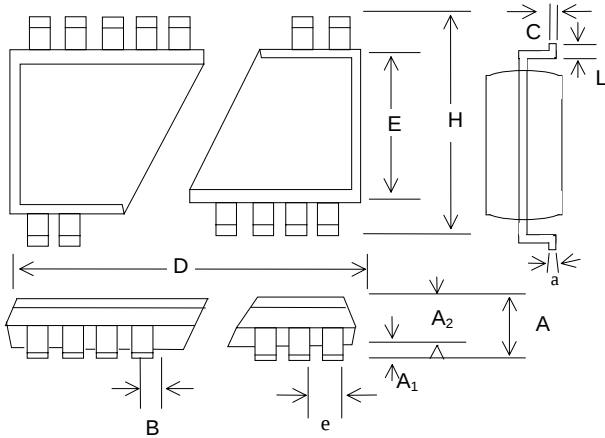


Point to Point Load Circuit

1:10 Clock Fanout Buffer

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Package Drawing and Dimensions



20 Pin SSOP Outline Dimensions

SYMBOL	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	-	-	0.079	-	-	2.0
A ₁	0.002	-	0.006	0.05	-	0.15
A ₂	0.065	0.069	0.073	1.65	1.75	1.85
B	0.009	-	0.015	0.22	-	0.38
C	0.004	-	0.010	0.09	-	0.25
D	0.272	0.283	0.295	6.90	7.20	7.50
E	0.197	0.209	0.220	5.00	5.30	5.60
e	0.026 BSC			0.65 BSC		
H	0.291	0.307	0.323	7.40	7.80	8.20
L	0.022	0.030	0.037	0.55	0.75	0.95
a	0°	-	8°	0°	-	8°

20 Pin SOIC Outline Dimensions

SYMBOL	INCHES			MILLIMETERS		
	MIN	NOM	MAX	MIN	NOM	MAX
A	.09252	-	.1043	2.35	-	2.65
A ₁	.003937	-	.01181	.10	-	.30
A ₂	.08858	-	.09252	2.250	-	2.350
B	.01299	-	.02008	.33	-	.51
C	.009055	-	.01260	.23	-	.32
D	.4961	-	.5118	12.60	-	13.00
E	.2913	-	.2992	7.40	-	7.60
e	0.050 BSC			1.27 BSC		
H	.3937	-	.4193	10.00	-	10.65
L	.01575	-	.050	.40	-	1.27
a	0°	-	8°	0°	-	8°



Preliminary

CY2CC810

1:10 Clock Fanout Buffer

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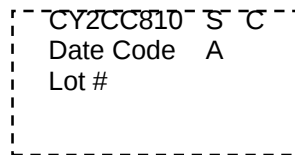
Ordering Information

Part Number	Package Type
CY2CC810S	20 Pin SOIC
CY2CC810O	20 Pin SSOP

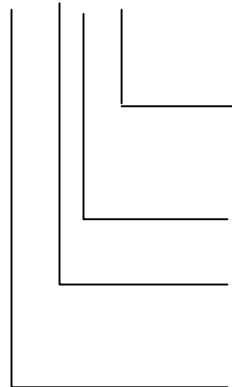
Note: the ordering part number is formed by a combination of device number, package and screening as shown below.

Marking:

Example:



CY2CC810S



Package

S = SOIC

O = SSOP

CYPRESS Device Number

INPUT OUTPUT Family

CYPRESS Communication Link Series

Notice

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Document Title: CY2CC810 1:10 Clock Fanout Buffer

Document Number: 38-07056

Rev.	ECN No.	Issue Date	Orig. of Change	Description of Change
**	107081	06/07/01	IKA	Convert from IMI to Cypress