

1GHz TTL/CMOS Potato Chip

FEATURES:

- . Patented technology
- . Max input frequency > 1GHz
- . Operating frequency up to 1GHz with 2pf load
- . Operating frequency up to 700MHz with 5pf load
- . Operating frequency up to 400MHz with 15pf load
- . Operating frequency up to 200MHz with 50pf load
- . Very low output pin to pin skew < 20ps
- . VCC = 1.65V to 3.6V
- . Propagation delay < 1.3ns max with 15pf load
- . Low input capacitance: 3pf typical
- . 1:2 fanout
- . Available in 8 pin SOIC package

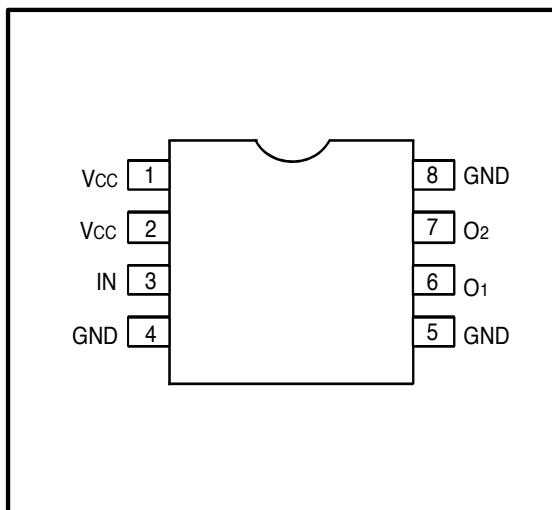
DESCRIPTION:

Potato Semiconductor's PO74G38072A is designed for world top performance using submicron CMOS technology to achieve 1GHz TTL output frequency with less than 20ps output pin to pin skew.

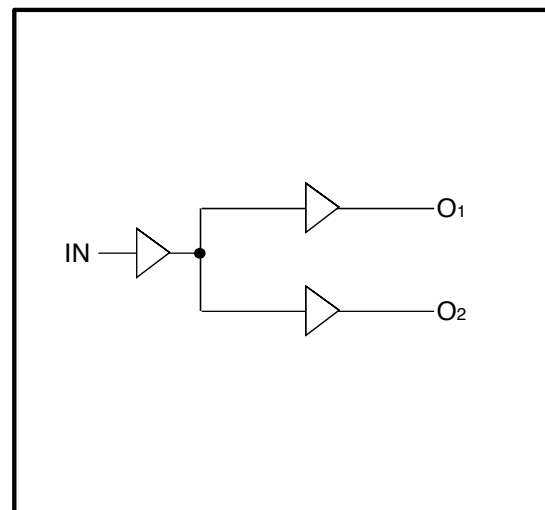
PO74G38072A is a 3.3V CMOS 1 input to 2 outputs Buffered driver to achieve 1GHz output frequency. Typical applications are clock and signal distribution.

Inputs can be driven from either 3.3V or 5V devices. This feature allows the use of these devices as translators in a mixed 3.3V/5V system environment.

Pin Configuration



Logic Block Diagram



Pin Description

Pin Name	Description
IN	Input
Ox	Outputs

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Maximum Ratings

Description	Max	Unit
Storage Temperature	-65 to 150	°C
Operation Temperature	-40 to 85	°C
Operation Voltage	-0.5 to +4.6	V
Input Voltage	-0.5 to +5.5	V
Output Voltage	-0.5 to Vcc+0.5	V

Note:

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

DC Electrical Characteristics

Symbol	Description	Test Conditions	Min	Typ	Max	Unit
VOH	Output High voltage	Vcc=3V Vin=VIH or VIL, IOH= -12mA	2.4	3	-	V
VOL	Output Low voltage	Vcc=3V Vin=VIH or VIL, IOH=12mA	-	0.3	0.5	V
VIH	Input High voltage	Guaranteed Logic HIGH Level (Input Pin)	2	-	Vcc	V
VIL	Input Low voltage	Guaranteed Logic LOW Level (Input Pin)	-0.5	-	0.8	V
IiH	Input High current	Vcc = 3.6V and Vin = 5.5V	-	-	1	uA
IiL	Input Low current	Vcc = 3.6V and Vin = 0V	-	-	-1	uA
VIK	Clamp diode voltage	Vcc = Min. And IIN = -18mA	-	-0.7	-1.2	V

Notes:

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 3.3V, 25 °C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
5. VoH = Vcc – 0.6V at rated current

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Power Supply Characteristics

Symbol	Description	Test Conditions (1)	Min	Typ	Max	Unit
Iccq	Quiescent Power Supply Current	Vcc=Max, Vin=Vcc or GND	-	0.1	30	uA
ΔIcc	Power Supply Current per Input High	Vcc=Max, Vin= Vcc-0.6V	-	50	300	uA

Notes:

1. For conditions shown as Max. or Min., use appropriate value specified under Electrical Characteristics for the applicable device type.
2. Typical values are at Vcc = 3.3V, 25°C ambient.
3. This parameter is guaranteed but not tested.
4. Not more than one output should be shorted at one time. Duration of the test should not exceed one second.
5. VoH = Vcc – 0.6V at rated current

Capacitance

Parameters (1)	Description	Test Conditions	Typ	Max	Unit
Cin	Input Capacitance	Vin = 0V	3	4	pF
Cout	Output Capacitance	Vout = 0V	-	6	pF

Notes:

- 1 This parameter is determined by device characterization but not production tested.

Switching Characteristics

Symbol	Description	Test Conditions (1)	Max	Unit
tPLH	Propagation Delay A to Bn	CL = 15pF	1.3	ns
tPHL	Propagation Delay A to Bn	CL = 15pF	1.3	ns
tr/tf	Rise/Fall Time	0.8V – 2.0V	0.8	ns

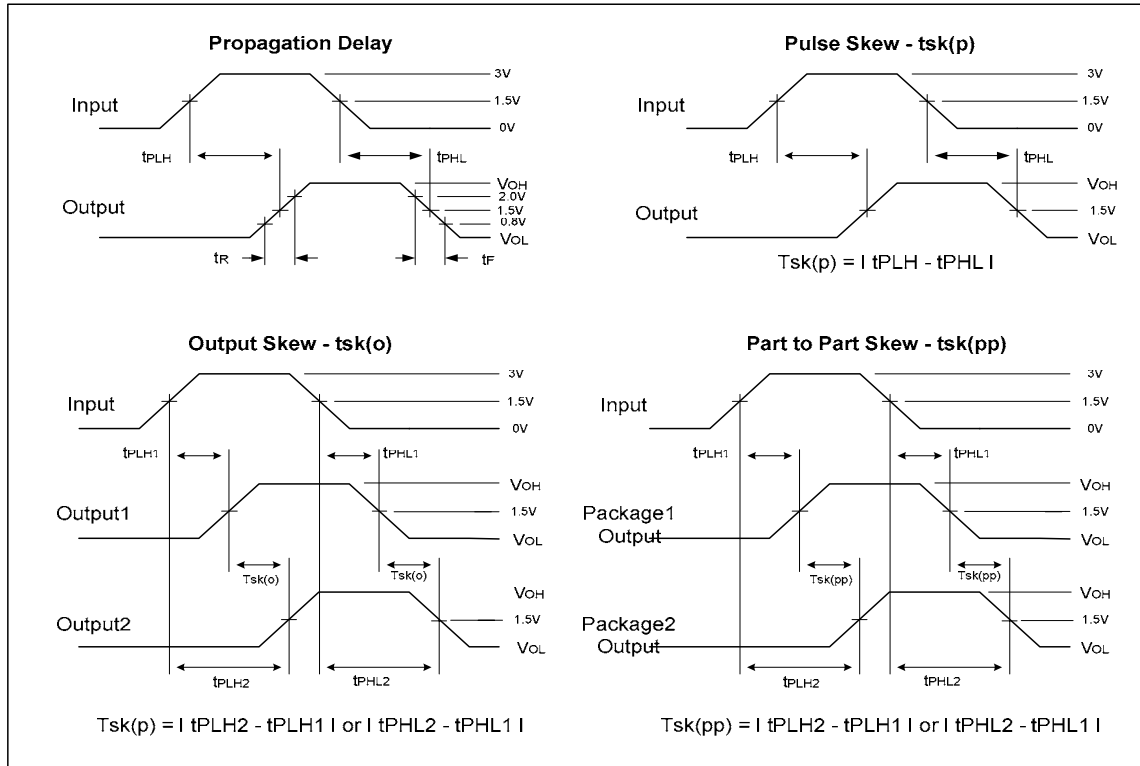
tsk(o)	Output Pin to Pin Skew (Same Package)	CL = 15pF, 125MHz	20	ps
tsk(pp)	Output Skew (Different Package)	CL = 15pF, 125MHz	0.25	ns
fmax	Input Frequency	CL = 50pF	200	MHz
fmax	Input Frequency	CL = 15pF	400	MHz
fmax	Input Frequency	CL = 5pF	700	MHz
fmax	Input Frequency	CL = 2pF	1000	MHz

Notes:

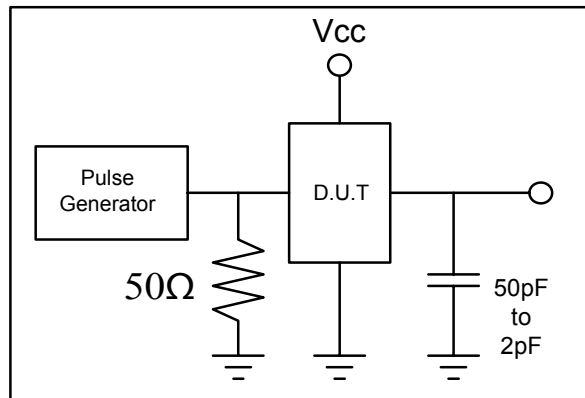
1. See test circuits and waveforms.
2. tPLH, tPHL, tsk(p), and tsk(o) are production tested. All other parameters guaranteed but not production tested.
3. Airflow of 1m/s is recommended for frequencies above 133MHz

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Test Waveforms

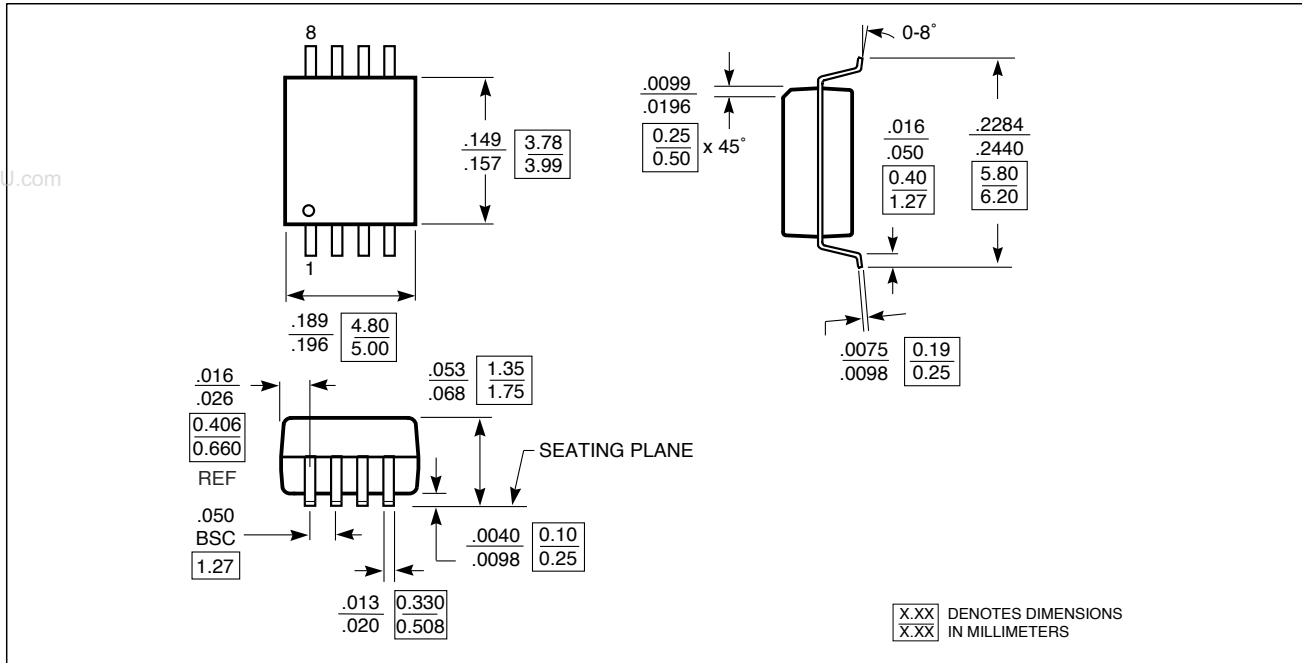


Test Circuit



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Packaging Mechanical Drawing: 8 pin SOIC



Ordering Information

Ordering Code	Package			Top-Marking	T _A
PO74G38072ASU	8-pin SOIC	Tube	Pb-free & Green	PO74G38072AS	-40°C to 85°C
PO74G38072ASR	8-pin SOIC	Tape and reel	Pb-free & Green	PO74G38072AS	-40°C to 85°C